Gender Diversity, Shareholder Activism and Corporate Environmental Performance

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Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

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Related papers submitted to the journal and received by the conference

Yu, J., and Liu, Y. S. Gender Diversity and Environmental Activism: Gender Discrimination or Socialisation? Under Revision and Resubmission (First Round) with *Business Strategy and the Environment* (3*)

Yu, J., and Liu, Y. S. How Shareholder Activism Brings Change to Corporate Environmental Performance? – The Mediating Effect of Gender Diversity. Received by 2023 American Accounting Association (AAA) Annual Meeting

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Dedication

I dedicate this work to my parents who have supported and encouraged me throughout my studies.

Abstract

This thesis comprises three separate but inter-connected studies, all of which are linked by the common themes of shareholder activism and gender diversity. The first study empirically investigates the association between different executive roles taken by women and environmental shareholder activism at different stages. Building on gender socialisation theory and the managerial power perspective, this study finds that environmental activists are more likely to target firms with women CEO-Chairs at the shareholder proposal filing stage, while no significant preference with general women directors or CEOs for a sample of 2066 firm-year observations of the U.S. S&P 1500 companies for the years 2010 to 2018. To explore the rationale of such preference (gender discrimination or socialisation), this study further investigates the gender preference at the withdrawn stage and finds that both CEOs and CEO-Chairs show a strong positive influence and the influence from CEO-Chairs is more pronounced. This study suggests that both managerial power and women traits, such as being more altruistic, collaborative, and communicative, are plausible explanations for this gender effect and women without significant and legitimate power in environmental affairs are unable to exert a significant influence.

The second study examines the extent to which environmental shareholder activism affects corporate environmental performance through gender diversity on corporate boards. Based on gender socialisation theory, this study hypothesises that women directors are more interpersonal in communicating with environmental shareholders and inclusive in dealing with environmental concerns. In analysing panel firm-level data from the U.S. S&P 1500 companies from 2010 to 2018 for a sample of 2003

firm-year observations, this study finds a mediating effect of gender-diverse corporate boards on the association between withdrawn environmental shareholder proposals and corporate environmental performance. The findings further reveal that women directors holding pivotal executive power have no impact on enhancing environmental performance through environmental shareholder proposals with a withdrawal decision. In addition, the gender mediation effect is stronger in firms operating in environmentally sensitive industries. This study contributes to research on environmental shareholder activism, gender diversity on corporate boards, and gender policy.

The third study employs a fuzzy set qualitative comparative analysis to shed light on previously under-researched areas of the literature concerning how environmental shareholder activism works in concert with other corporate governance mechanisms to influence the level of corporate environmental performance. Specifically, this study presents a holistic framework based on configuration theory for a sample of 115 manufacturing companies in the United States for the year 2018. The empirical results show that a high level of environmental performance is dependent on a combination of environmental shareholder activism and other corporate governance mechanisms such as board gender diversity, board size, board independence, and institutional ownership and concentration. This study demonstrates that it is feasible to obtain high levels of environmental performance by combining all these elements appropriately. The findings give credence to the contention that the effectiveness of environmental shareholder activism differs depending on its setting, such as the presence or

absence of a high level of gender diversity on boards. This work contributes to a better understanding of the effects of various sets of governance mechanisms on corporate environmental performance from a configurational perspective.

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List of abbreviations

WOCB	Women directors on corporate boards
ESP	Environmental shareholder proposals
WESP	Withdrawn environmental shareholder proposals
CEP	Corporate environmental performance
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
GHG	Greenhouse gases
COP	Conference of the Parties
CSR	Corporate social responsibility
CSP	Corporate social performance
TBL	Triple bottom line
ESG	Environmental, social, and governance
SRI	Socially-responsible investment
GRI	Global Reporting Initiative
ISO	International Organisation for Standardisation
SEC	Securities and Exchange Commission
AGM	Annual general meeting
CEO	Chief executive officer
BOD	Board of directors

IRRC	Investor Responsibility Research Centre
KLD	Kinder, Lydenberg, Domini
S&P	Standard and Poor
NGOs	Non-governmental organisations
CERES	Coalition for Environmentally-Responsible Economies
CDP	Carbon Disclosure Project
ISS	Institutional Shareholder Services
NAICS	North American Industry Classification System
LPM	Linear probability model
GMM	Generalised method of moments
FE	Fixed effects
fsQCA	Fuzzy set qualitative comparative analysis
MSCI	Morgan Stanley Capital International
QCA	Qualitative comparative analysis
PRI	Proportional reduction in inconsistency
OLS	Ordinary least squares
DKSE	Driscoll-Kraay standard errors

1. INTRODUCTION

This thesis comprises three separate but inter-connected studies, all of which are linked by the common themes of shareholder activism and gender diversity. The first study investigates the effect of women on corporate boards (WOCB) in various influential positions on environmental shareholder proposals (ESP) at different stages of decision results i.e., filed and withdrawn. The second study examines the question of whether WOCB have a mediating effect on the association between withdrawn environmental shareholder proposals (WESP) and corporate environmental performance (CEP). The third study employs configurational analysis to examine the impact of six governance mechanisms, including WOCB and ESP, on CEP. There is currently a limited body of literature focusing on the shareholder activism mechanism in relation to CEP, especially through the lens of gender diversity. This thesis aims to contribute to the ongoing interest in environmental shareholder activism, WOCB, and CEP. The subsequent sections of this chapter provide a contextual background to the study, followed by the study's rationale, research aims and objectives, research scope and method, contributions, and finally the structure of the thesis.

1.1 Contextual background

Environmental issues have been gaining increasing importance in the public arena. From severe floods to extreme heat and drought, weather and climate-related catastrophes have harmed millions of people, costing billions to global societies. Continuous efforts are being made on a global scale to mitigate environmental issues. The 1972 United Nations Conference on the Environment in Stockholm was

the first world conference to make the environment a major issue. The participants have adopted a series of environmental management principles, bringing environmental issues to the forefront of international concerns, and initiating a discourse between industrialised and developing nations on the relationship between economic growth, pollution of air, water, and oceans, and the well-being of people worldwide (UN, 1972).

Thereafter, the worldwide environmental treaty known as the United Nations Framework Convention on Climate Change (UNFCCC) came into force in 1992. All parties, including the United States (U.S.), have entered an agreement to stabilise greenhouse gases (GHG) and prevent harmful human interference with climate systems. Since then, all parties involved have convened annually at the Conference of the Parties (COP) to examine environmental issues (UNFCCC, 1992). The most recent conference, COP 27, held in 2022, aims to build on previous achievements and pave the way for further ambitious actions to combat climate change worldwide (UNEP, 2022). It is evident that environmental issues have become a primary concern, and continue to attract significant global attention.

At the current time, environmental issues in a globalised context have become prominent due to their visibility, urgency, and quantifiability relative to social performance, where researchers have extracted environmental aspects separately in order to study them further, regarding it as CEP element (Trumpp, Endrikat, Zopf, & Guenther, 2015; Zopf & Guenther, 2015). Further, a number of environmental impact standards such as the Global Reporting Initiative (GRI) framework and parts of different standards of the International Organisation for Standardisation (ISO),

such as ISO 14001, provide companies with indicators and methods for the management of environmental considerations (Norman & MacDonald, 2004).

Corporate governance is a crucial mechanism to enhance corporate engagement in CSR, constituting a system of rules, practices, and procedures by which a company is directed and controlled (Tricker & Tricker, 2015). To maximise shareholder wealth and protect shareholder interests, corporate governance can be regarded as a technique to reduce conflicts of interest between self-interested managers (agents) and shareholders (principals) who are responsible for a firm's residual cash flows (Shleifer & Vishny, 1997). Shleifer and Vishny (1997, p. 737) define corporate governance as: "the ways in which suppliers of finance assure themselves of getting a return on their investment".

Efficient corporate governance is essential to prevent management, which runs a company and has access to privileged information, from taking advantage of shareholders, who are the main risk-bearers of corporate investment. However, as a business expands, particularly in Anglo-Saxon countries, the debate emerges over the shareholder model versus the stakeholder model of corporate governance. There is discussion as to whether a firm's external environment should be strengthened in order to build a sustainable agency relationship; the corporate governance system should also ensure the interests of a wide variety of stakeholders (Letza, Sun, & Kirkbride, 2004). In this instance, the effectiveness of corporate governance extends beyond shareholders to encompass all stakeholders. As a result, systems of corporate governance have been improved in the pursuit of an optimal governance structure; there has never been a ‘one-size-fits-all’ system,

thus the concept is still being shaped and influenced by not only economic logic, but also socio-political conditions in its process of continuous development. As suggested by Roy (1999), corporate governance is a social process involving power, legislation, and institutional contexts, which cannot be separated from social and non-economic circumstances.

Shareholder activism is widely acknowledged as one of the most important corporate governance mechanisms, serving to protect the interests of shareholders and other stakeholders. "Shareholder activism is defined as the use of the ownership position to actively influence company policy and practice" (Sjöström, 2008, p. 142). This refers to the actions undertaken by a shareholder, or a group of shareholders, to influence the direction and policies of a company (Sjöström, 2008). Shares are traded daily on stock exchanges, in the form of certificates of equity, to provide their owners with control and cashflow rights and to represent a company's ownership. Because equity grants voting rights, shareholders – the group that owns the company's shares – can exert power over the board of directors (Black, 1990).

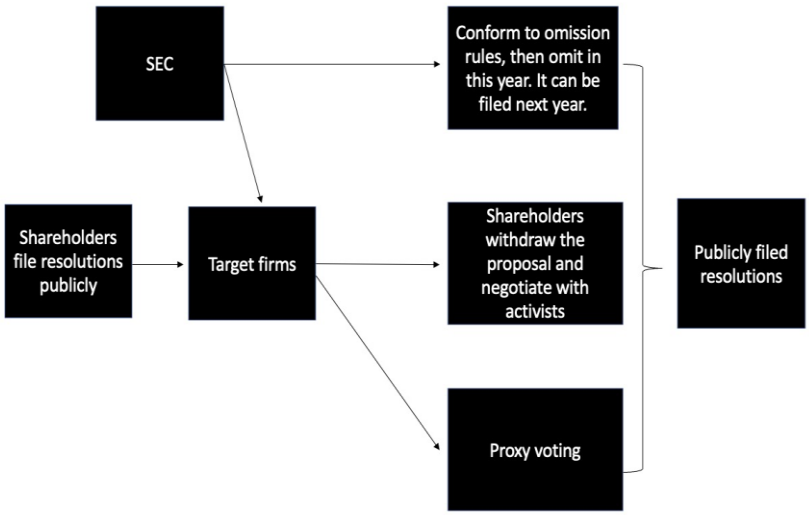
Based on activists' goals and objectives, shareholder activism has several common approaches. For example, shareholders can conduct a private dialogue with a firm's management and/or board of directors about their issues, present shareholders' proposals to an annual meeting and vote on them, launch a media campaign to raise awareness of their plight and encourage support, and/or file a lawsuit to force a company to change its practices (Gillan & Starks, 2000; Renneboog & Szilagyi, 2011; Sjöström, 2008; Smith, 1996). Through activism, shareholders are able to express their opinions and concerns about environmental issues to managers and

boards, using their ownership status to influence business activity. Shareholder activism on environmental issues originated in the 1960s in the U.S., becoming increasingly active and prominent in the late 1990s. Since the national government regulatory agency tasked with overseeing the corporate sector, the Securities and Exchange Commission (SEC), authorised shareholders to submit proposals in 2000, shareholder activism on environmental issues has gained prominence, with the number of shareholders in favour of environmental proposals increasing significantly (Rodrigue & Michelon, 2021).

Shareholder proposals, which are formal requests submitted by shareholders to a company's management for consideration at the annual general meeting (AGM), often address problems such as social or environmental responsibility, corporate governance, chief executive officer (CEO) compensation, and other matters of importance to shareholders (Graves, Waddock, & Rehbein, 2001). This is a means by which investors can actively express their concerns and make suggestions at minimal expense (Rojas, M'zali, Turcotte, & Merrigan, 2009), granting them a voice in a company's decision-making process in a more direct and collaborative approach, as shareholders are enabled to engage with management and collaborate towards common goals. By presenting a shareholder proposal, shareholders can influence corporate decision-making and increase awareness of environmental issues, which could result in changes to business practices and regulations. It is therefore worthwhile to investigate the association between environmental shareholder proposals and environmental performance.

A brief description of the shareholder proposal process is shown in Figure 1.1. Three results may occur once the shareholder resolution is submitted: withdrawn, omitted, and voted on statuses. The procedure for filing shareholder resolutions is depicted in Figure 1.1. Shareholders start with the filing of a proposal. Then the company receives it and approaches to three main results decisions. The company could seek to omit a proposal under Rule 14a-8 by requesting a 'no-action letter' from the Staff of the SEC's Division of Corporation Finance if the proposal contains excludable contents. If the company finds a way to further deal with this issue, it will require moving to a withdrawal process. The final resolution will be presented in the proxy statement and voted at the annual general meeting. Voting at the AGM is the most common result to bring a certain impact on the company, besides, the withdrawal of a submitted proposal can also indicate a success when companies are willing to make some commitments .

Figure 1.1 Model of the shareholder resolution process.[1]



[1] Adapted from Rehbein et al. (2013) and Bauer et al. (2015)

Although shareholder proposals have played a vital role in advancing corporate governance and highlighting the main risks of environmental issues (Monks, Miller, & Cook, 2004), it can be controversial and leads to tensions between shareholder and management because they are only consultative and legally non-binding in the United States (U.S.). It means that even if a majority of support is received, firms still have great discretion on whether and how to respond to the proposals (Dobson, Hensley, & Rastad, 2018). As a result, governance features significantly influence the negotiation and voting decisions, because the board decides which shareholder proposals are to be withdrawn or moved forward for a vote (Byrd & Cooperman, 2014).

Furthermore, among all the corporate governance mechanisms, Jensen (1993) suggests that a board of directors (BOD) has the primary duty of aligning the interests of a business with those of its shareholders, making strategic decisions, and overseeing company management. Directors serve as a company's strategic leaders, making key decisions on long-term aims and objectives, contributing to a board's ability to implement sound corporate governance practices and boosting a company's bottom line (Kemp, 2006). Notably, a growing body of research demonstrates that the presence of WOCB is one of the most important corporate governance mechanisms for the improvement of strategic decision-making (Nielsen & Huse, 2010b; Rao & Tilt, 2016; Terjesen, Sealy, & Singh, 2009; Walls, Berrone, & Phan, 2012). Specifically, research indicates that gender diversity on boards significantly contributes to the fulfilment of companies' environmental responsibilities. For example, Davidson and Freudenburg (1996) and Bord and

O'Connor (1997) conclude from their early research that women demonstrate a higher level of care for the environment than men. As environmental consciousness grows, ecological perspectives expand on threats to plants and animals, human health and well-being, and even the survival of the planet (Eckersley, 1992); once risks to health and personal well-being are coupled with environmental issues, women's concerns for the environment tend to exceed those of men (Bord & O'Connor, 1997; Davidson & Freudenburg, 1996).

Therefore, this thesis proposes three research questions after investigating the contextual background: Does gender diversity influence the decisions of environmental shareholder activists? Do shareholder proposals really improve company performance, and how? How could the company do to attain a better sustainable outcome? The following section discusses the rationale for this thesis.

1.2 Rationale of this thesis

This thesis investigates the U.S. market. The rationale for investigating the U.S. market is behind the regulatory, reform, and policy issues. The submission of shareholder proposals at an AGM has particularly been addressed in the U.S. (Gillan & Starks, 2007; Sjöström, 2008) since the SEC established a regulation governing the solicitation of shareholder proposals and issued Shareholder Proposal Rule 14a-8 in 1934, which permits shareholders to present solicited proposals in company proxy statements in order to express their concerns and request a vote at annual general meetings (Black, 1990; Monks et al., 2004). In the US, however, proposals submitted under Rule 14a-8 have only been recommendations, meaning that even when passed by a majority vote, they are

non-binding and advisory (Levit & Malenko, 2011). Due to the non-binding nature of the rule, the subsequent implementation of a voting proposal by companies can be obscured, and the needs of shareholders may not be met. As a result, it is uncertain how environmental shareholder proposals will influence the environmental performance of a company in the future.

Existing research has a long-standing interest in shareholder proposals for corporate social and environmental responsibility. Initially, a variety of descriptive studies were conducted to examine the impact of ESP on CEP. These conclude that a growing number of environmental proposals have exerted a substantial impact on the environmental consciousness of corporations (Campbell, Gillan, & Niden, 1999; Monks et al., 2004; Rojas et al., 2009; Tkac, 2006; Vogel, 1983). Campbell et al. (1999) examine the 1997 proxy season, which is usually the spring season when the majority of public companies in the U.S. prepare for their annual shareholders' meetings. They find that the average votes cast on social and environmental proposals received support of 6.6%, with the highest level of support being 19.2%. In contrast, the majority of proposals from 1970 to 1982 received only 3% support (Vogel, 1983), indicating that environmental proposals received a higher level of support from investors from 1970 to 1997, which may have exerted a larger impact on managements' approach to addressing environmental issues. Similarly, Monks et al. (2004) examine shareholder proposals to 81 large American firms over the four-year period 2000 to 2003; they find that climate change-related resolutions received the highest level of shareholder support. Tkac (2006) studies socially-responsible shareholder activism over the period 1992 to 2002, identifying an upward trend in proposal submission by socially-responsible mutual funds during this time period. Both studies indicate an increase in environmental proposals, as

well as high voter participation and support for measures to address climate change and the development of renewable energy alternatives. Rojas et al. (2009) analyse social shareholder-initiated proposals submitted in US corporations from 1997 to 2004, where the proposals are sourced from the annual report of the Investor Responsibility Research Centre (IRRC). Analysis indicates that the power to influence management is stronger for some types of resolution issues, such as Energy and the Environment.

Previous research has examined the impact of ESP on CEP, but there is currently limited understanding of the impact of ESP on corporate behaviours (David, Bloom, & Hillman, 2007; O'Rourke, 2003; Sjöström, 2008). O'Rourke (2003) uses case studies and interviews to analyse the growing trend of shareholder proposals on social and environmental issues. It is asserted that shareholder proposals cannot serve as a substitute for state regulation and control; they result only in voluntary change by corporations which have achieved their economic goals. In addition, although shareholder proposals are one of the most direct means for the public to voice their concerns to firms, it is highlighted that the changes are incremental, rather than being revolutionary and providing long-term remedies. Clark, Salo, and Hebb (2008) attempt to determine the influence of shareholder proposals on CEP, although they reach a similar conclusion that their environmental consequences are minimal or even negative. David et al. (2007) conclude that shareholder proposals can be damaging to CSP, as measured by Kinder, Lydenberg, Domini (KLD)'s environmental and social ratings. This can be explained by the inclination of corporations to respond to shareholder proposals, and the public expression of displeasure they represent, by devoting more resources to opposing external pressures at the expense of social performance. This study also concludes that

managers tend to ‘settle’ with influential shareholders, although this is merely a symbolic type of capitulation, whilst managers resist more substantive changes. Overall, Sjöström (2008) synthesises and maps studies on shareholder activism and corporate social and environmental responsibility in the U.S. between 1983 and 2007. This includes CSR proposal topics and proponents, vote results, activism targets, and the effects of corporate policy and practices. This study contends that the majority of shareholder proposals fail, being unable to bring about substantial changes within a corporation. The study also demonstrates that there is a dearth of research which draws conclusions based on longitudinal empirical data, and further studies are required to examine how shareholder activism affects companies.

From an empirical perspective, few empirical evidence has investigated the effect of ESP on CEP (Byrd & Cooperman, 2012; Flammer, Toffel, & Viswanathan, 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009). Reid and Toffel (2009) use social movement theory to examine how citizen movements struggle to exert an influence on the state, and how social activists promote organisational change. Using the KLD Research database, Analytics SOCRATES, and the Interfaith Centre on Corporate Responsibility, this study examines Standard and Poor’s (S&P) 500 companies from 2004 to 2006. It finds that shareholder resolutions are likely to motivate environmentally-sensitive industries to adopt new environmental policies, such as carbon disclosure. Lee and Lounsbury (2011) use social movements and organisational theory to explain how various organisational characteristics influence the attitudes of firms towards social movement activists, and how activism within organisations supports the establishment of a valid agenda in corporate decision-making processes. They analyse 58 public companies' benzene waste management practices using the EthVest database, and conclude that

environmental shareholder resolutions exert substantial and positive effects on the environmental performance of the targeted firms. Byrd and Cooperman (2012) analyse a sample of shareholder resolutions made by U.S. firms during the period 2007 to 2009 which address climate change by evaluating press releases, companies' annual reports and sustainability reports, and follow-up reports from non-governmental organisations (NGOs) such as the Coalition for Environmentally-Responsible Economies (CERES), As You Sow, the Investor Environmental Network, and the IRRC. They conclude that shareholder proposals do result in some business change; nevertheless, they identify the fact that negotiated, withdrawn, and omitted proposals are more effective than votes, and even majority votes, in terms of future actions taken, as evidenced in subsequent annual and sustainability reports. Flammer et al. (2021) use climate change risk disclosures from Carbon Disclosure Project (CDP) and shareholder activism filings from the Institutional Shareholder Services (ISS) database for the years 2010 to 2016 for U.S. public companies. They report a positive correlation between environment-related shareholder proposals and CDP reporting. However, several research studies, such as Walls et al. (2012), demonstrate a negative association in this regard. By using the RiskMetrics database on proxy voting in S&P 500 companies during the period 1997 to 2005, they identify a negative correlation between shareholder activism and environmental strength.

Both existing descriptive and empirical evidence shows that there have been some positive effects of ESP on corporate behaviours, which may be caused by the influence, power, and requests of shareholders. However, the effects of corporate board members' participation with shareholder activists and their substantial influence on CEP have rarely been examined, so that the effect of ESP on corporate

behavioural change has been questioned. Therefore, this thesis attempts to fill the gap in investigating the influence of environmental proposals on CEP and contributes to shareholder activism and CEP literature by revealing whether and how ESP brings changes to environmental performance.

Many studies support the notion that women tend to be more concerned about the natural environment (Bord & O'Connor, 1997; Davidson & Freudenburg, 1996; Park, Choi, & Kim, 2012; Wehrmeyer & McNeil, 2000). This has been covered in various research disciplines including environmental management, business ethics, social science, and social psychology. Although women directors have been shown to be beneficial to CEP, there is a deficient level of gender diversity on corporate boards in the U.S. (Chen, Leung, & Evans, 2018). Unlike Norway, France, Italy, and Belgium, which demand a certain proportion of female board members, U.S. states such as Illinois merely require one to three women to sit on a board, or have no specific gender quota requirements, such as Maryland, New York, and Washington. In the U.S., only Massachusetts and Pennsylvania have embraced the 'comply or explain' regulatory paradigm. This implies that the U.S. has adopted a soft approach to the imposition of voluntary board gender diversity (Kang, Ashton, Orujov, & Wang, 2022), and the number of WOCB in the U.S. remains low. Furthermore, research on WOCB in the U.S. remains underdeveloped, with a lack of thorough and systematic studies. This thesis sets out to investigate the role of corporate governance in matters such as WOCB and shareholder activism in the enhancement of CEP in US-based corporations.

Previous research has used a variety of management theories to demonstrate that gender diversity on a board improves CEP (Bear, Rahman, & Post, 2010; Velte, 2017). For example, the resource dependency theory claims that the management may rely on the board of directors for the necessary allocation of resources to comprehend and respond to its environment (Boyd, 1990; Cohen, Krishnamoorthy, & Wright, 2008). It provides the justification for the board's function of providing critical advice and counsel (Hillman & Dalziel, 2003; Pfeffer, 1972), which can assist in managing CEP concerns effectively. The agency problem between the principal (shareholders) and agent (management) is explained by agency theory (Jensen & Meckling, 1976). It justifies the board's critical function of monitoring management on behalf of shareholders and protecting their interests (Fama & Jensen, 1983). In order to fulfil its monitoring responsibilities, the board needs to have the requisite depth and breadth of expertise, such as WOCB, to appropriately evaluate management and analyse the results of various business strategies in relation to CEP (Hillman & Dalziel, 2003). Stakeholder theory offers the rationale that firms should satisfy the needs of stakeholders by strengthening their social and environmental performance (Freeman, 1984), where a gender diverse board maintains a broader concern for various stakeholders than just profits. Arguably, these results are inconclusive, and the mechanism of WOCB is unclear.

However, in common with Nielsen and Huse (2010b), this paper contends that these management theories are not sufficient to explain gender differences on corporate boards, arguing that the deeper reason for women's attitudes towards environmental issues stems from social psychological theory. For example, gender socialisation theory posits that men and women develop different values and social expectations from society's dominant culture from childhood onwards. Xiao and

McCright (2015) conclude that, in the U.S., men learn to be competitive, assertive, and independent, while women learn to be empathetic, altruistic, and caring. The importance of altruism and the ethics of care in establishing a link between gender and ecological consciousness and pro-environmental action is highlighted by various studies in the field of psychology (Dietz, Kalof, & Stern, 2002; Franke, Crown, & Spake, 1997). As asserted by Slote (2007), the ethics of care and empathy constitute the foundation of feminist ethics. Stürmer, Snyder, and Omoto (2005, p. 533) discuss: “the role of empathy - an emotional reaction, including feelings of compassion, concern, and tenderness - in helping people in need”, and women show more ethics of care in environmental values due to their higher levels of empathy (Milfont & Sibley, 2016).

Further, some research applies feminine theories to women in the top management including gender socialisation theory. As Al-Shaer, Albitar, and Liu (2022) suggested, the power of the CEO has a substantial impact on company decisions regarding social and environmental actions. On corporate boards, the different executive and board roles have different responsibilities and levels of power, which make a difference in formulating corporate strategies and achieving sustainable outcomes (Finkelstein, 1992; Kipnis, 1972). High-powered directors attend to the needs of others and consider social comparisons when evaluating performance (Johnson & Lammers, 2012; Magee & Smith, 2013). As Boulouta (2013) indicated, female CEOs excel at resolving 'soft' issues, such as social and environmental issues. If a CEO acts in a stewardship role, “the executive manager, …, far from being an opportunistic shirker, essentially wants to do a good job, to be a good steward of the corporate assets (Donaldson & Davis, 1991, p. 51)”, they may

safeguard the firm and strengthen a firm's environmental practices (Davis, Schoorman, & Donaldson, 1997; Shui, Zhang, Smart, & Ye, 2022).

As a result, it is suggested that gender-diverse boards tend to express more concern about negative social and environmental performance (Boulouta, 2013). Elm, Kennedy, and Lawton (2001) and Kracher and Marble (2008) identify gender differences in moral reasoning because women have a higher capacity for reasoning and a greater tendency to act morally than men. Liu (2018) provides consistent evidence that female directors minimise environmental misconduct, demonstrating that firms with a higher WOCB or female CEOs on boards face fewer environmental lawsuits. In this regard, a gender-diverse board may outperform a less diverse one in terms of fulfiling environmental responsibilities. Moreover, Dietz et al. (2002) provide evidence that women are associated with a higher level of environmentalism because they prioritise altruism more than men. Slote (2007) discusses the role played by empathy in altruistic behaviours, suggesting that, when women possess high levels of empathy, they are more likely to help others while receiving nothing in return as altruism (Zickfeld, Schubert, Seibt, & Fiske, 2017). In this regard, WOCB may show an empathetic attitude not only towards a damaged environment but also towards those stakeholders who are in need.

Because environmental improvement is a common goal shared by WOCB and environmental shareholder activists, it is possible that they might collaborate to achieve a better CEP. Previous research demonstrates the favourable impact of feminine characteristics on ecologically-responsible behaviours within businesses (Glass, Cook, & Ingersoll, 2016; Kassinis, Panayiotou, Dimou, & Katsifaraki, 2016;

Liu, 2018; Setó-Pamies, 2015; Shoham, Almor, Lee, & Ahammad, 2017; Zou, Wu, Zhu, & Yang, 2018). Their findings reveal that WOCB are not concerned about climate change symbolically but put it into practice based on their feminine natures. WOCB are also inclined to engage in conversation because “ethical reasoning based on the ethics of care and empathy will elicit a stronger response from more gender-diverse boards” (Boulouta, 2013, p. 23), thus Ciocirlan and Pettersson (2012) identify the fact that corporations may recruit women to demonstrate their concern about climate change. Hence, in terms of environmental performance, a female-dominated board demonstrates not only a stronger environmental attitude but also proactive environmental responsiveness in comparison to a male-dominated board, which shows a high level of willingness to communicate with environmental shareholder activists on demand.

Forthermore, empirical studies have examined the influence of female CEOs, who hold primary responsibility for initiating and implementing strategic decisions on corporate performance (Boyd, 1995; Post, Rahman, & McQuillen, 2015). Adams and Funk (2012) contend that male and female directors have fundamentally different core values and risk attitudes, with women being more open to risk. For example, female executives are more likely than their male counterparts to undertake innovative projects, while also being less likely to adhere to conventional norms (Eagly, Johannesen-Schmidt, & Van Engen, 2003). It is concluded that when faced with environmental challenges, female CEOs outperform their male counterparts.

Nevertheless, managerial power perspective posits that powerful CEOs may engage in discretionary and opportunistic behaviour to pursue their own aims at the expense of shareholder interests and in conflict with stakeholder requirements (Fama & Jensen, 1983). Because of the associated costs and inefficient value maximisation, powerful CEOs may decide against pursuing environmental projects (Rashid, Shams, Bose, & Khan, 2020). In this situation, female CEOs may be incapable of achieving objectives of environmental shareholder activists. Further, Gupta, Han, Mortal, Silveri, and Turban (2018) demonstrate a positive correlation between female CEOs and shareholder activism based on role congruity theory; this argues that female CEOs are far more likely than their male counterparts to come under pressure from activist investors due to gender prejudice in leadership roles (Koenig, Eagly, Mitchell, & Ristikari, 2011). They suggest that female CEOs may face a 'glass ceiling', which will restrain their work capability. Further, 'glass cliff' is a concept described by Ryan and Haslam (2007) to denote the fact that women in executive positions on corporate boards are more likely than men to be placed in positions where the risk of failure is highest, or they are more likely to be appointed during periods of economic decline or crisis. Studies demonstrate that, even after women have succeeded in breaking through the glass ceiling, they continue to face discrimination (Gupta et al., 2018).

To assess the managerial power of executive directors, the dimension of female CEO duality has not been uncovered in gender diversity and shareholder activism literature. CEO duality refers to whether the CEO and chairman positions are merged and reflects the power the CEO exerts, which can influence corporate performance (Al-Shaer et al., 2022). When a firm's CEO also serves as the chairman of the board of directors, CEO–chair duality increases the power and accountability

of the CEO. As with other executive directors, CEO duality would acquire a more comprehensive power base and control locus (Hambrick & Finkelstein, 1987). When the chairman and CEO are the same person, the command becomes united, eliminating role ambiguity and conflict that can occur when power is shared (Donaldson, 1990). The increased power that comes with being a female CEO-Chair would permit them to take into account non-economic considerations, and environmental activists are therefore more inclined to start their environmental agenda with firms that have female CEOs and CEO–chair dualities. Currently, a few pieces of research have discussed the impact of CEO duality on corporate board performance (Elsayed, 2007), but little research has looked at the role of female CEO duality facing shareholder activism.

Research on the correlation between WOCB and ESP in corporations is limited, although several existing studies demonstrate the influence of powerful female executives on shareholder activism (Francis, Hasan, Shen, & Wu, 2021; Gupta et al., 2018). Triana, Miller, and Trzebiatowski (2014) suggest that female directors in crucial positions on boards may either propel or impede strategic change and firm performance, depending on the level of power they hold. Francis et al. (2021) identify the fact that female CEOs are more likely to interact and collaborate with hedge fund activists to reach intervention goals due to their effective and transformational leadership styles (Eagly & Johnson, 1990). Jackson, Rennekamp, and Steenhoven (2021) supplement the body of literature with an experimental study which investigates various investor reactions based on CEOs' gender. It is found that female CEOs are more inclined than their male counterparts to co-operate with activist shareholders. Faccio, Marchica, and Mura (2016) extend the finding that firms run by female CEOs have a higher chance of survival than similar

firms run by male CEOs when facing a threat. As addressed by the recent work from Francis et al. (2021) and Jackson et al. (2021), female CEOs are more favorable during shareholder activism campaigns, advance the company, and improve value for shareholders.

However, based on existing literature, it is found that there is a lack of consensus that can be attributed to a range of limiting constraints and limitations of the existing research, including insufficient matching of WOCB with shareholder activism and CEP, simplified theoretical frameworks lacking social-psychological consideration such as the exploration in gender socialisation theory, which exclude crucial aspects, and datasets with little heterogeneity in terms of underlying firm characteristics. Even in studies in which the majority of the intrinsic obstacles to the work are properly addressed, the degree of novelty, and more nuanced concerns about the relationship under investigation, are often limited. As a result, there appears to be much room for academic contributions in this particular research area, both in terms of adequately addressing issues that have already been explored, and in terms of expanding the body of literature by investigating new topics, which leaves substantial practical motivations to investigate the relationship between WOCB, ESP, and CEP. Therefore, this thesis attempts to examine the relationship between WOCB, ESP, and CEP, including how WOCB influences ESP and how WOCB, ESP, and CEP are intertwined, and to provide policymakers in the U.S. with significant empirical evidence regarding gender quotas and shareholder proposals.

1.3 Research aims and objectives

The aim of this thesis is to explore the association between WOCB, ESP, and CEP of U.S. public companies. The thesis aims will be achieved through the following objectives:

1. To examine the relationship between different executive roles taken by female directors on corporate boards such as general directors on boards, CEOs, CEO-Chairs, and ESP at different stages i.e., ESP filed and ESP withdrawn.

2. To explore the mediating role of WOCB in the association between WESP and subsequent CEP.

3. To identify the configurations of different corporate governance mechanisms that lead to better CEP.

1.4 Research scope and methods

Scientific research adopts quantitative and qualitative methods in the modelling and analysis of numerous phenomena. The quantitative method seeks to obtain accurate and reliable measurements which facilitate statistical analysis (Queirós, Faria, & Almeida, 2017). Sridhar and Jones (2013) prove that economic and environmental impacts can be quantified by use of a quantitative approach; in other words, a company's CEP can be analysed because there is a quantitative standard against which its performance can be compared. Hence, this thesis uses quantitative research methods to study the effects of CEP.

Quantitative research involves the collection of data which is typically numeric, so that information can be quantified and subjected to statistical treatment (Creswell, 2003). Quantitative data collection methods rely on random sampling and structured data collection instruments which fit diverse experiences into pre-determined response categories where it concerns the testing of hypotheses derived from theory and/or being able to estimate the scale of a phenomenon of interest (Goundar, 2012). Quantitative research focuses on objectivity and is particularly appropriate when there is the possibility of collecting quantifiable measures of variables and inferences from samples of a population.

Disciplines such as mathematics and statistics assume a fundamental importance in the process of analysis and generalisation of results obtained (Queirós et al., 2017). Because the samples are generally large and are considered representative of a population, the results are taken as if they constitute a general, and sufficiently comprehensive, view of an entire population (Bridgmon & Martin, 2012). Statistics derived from quantitative research can be used to establish the existence of associative or causal relationships between variables, and the analysis of numerical data is carried out through statistical procedures (Kothari, 2004). Ultimately, the use of a quantitative approach to report research findings and produce results renders it easy to summarise, compare, and generalise (Queirós et al., 2017). Quantitative approaches are used for all three papers which comprise this thesis.

A descriptive and causal comparative quantitative research approach has been used for the three papers which comprise this thesis. A descriptive research approach is a basic research method which examines a situation as it exists in its current state. This involves the identification of the attributes of a particular phenomenon on an observational basis, or the exploration of a correlation between two or more phenomena (Leedy, Ormrod, & Johnson, 2014; Williams, 2007). Further, regarding the causal comparative research approach, the researcher examines how the independent variables are affected by the dependent variables

and takes into account cause-and-effect relationships between the variables. The causal comparative research design provides the researcher with the opportunity to examine the interaction between independent variables and their influence on dependent variables (Williams, 2007).

The sample is selected from S&P 1500 firms between 2010 and 2018, taking into account the influence of the 2020 'Women on Boards' Campaign which began in the U.S. in 2010. Voting results are obtained from the Shareholder Proposal S&P 1500 database within the ISS database; this provides access to proposals which came to a vote, are withdrawn, or omitted from the proxy by the SEC. Environmental performance scores are obtained from the Asset 4 database. Board characteristic data are obtained from the ISS Director and the BoardEx databases. Financial and accounting data are sourced from the CompustatFund and Factset databases. Data with filed resolutions and voting results from within this period are explicitly selected in the matter of natural environmental issues and topics according to the U.S. Environmental Protection Agency (EPA, 2023) (details are presented in Appendix A).

The vast majority of proposals are presented and updated annually. Firms in the sample could receive one or more proposals in multiple years, but do not always

receive an environmental proposal each year. A two-digit North American Industry Classification System (NAICS) code is used for industry effects. The final sample is an unbalanced panel dataset. Additionally, in contrast to the U.S., which has a relatively favourable legislative environment for shareholder activism, Europe lacks shareholder representative democracy, with shareholder proposals being less prevalent than in the U.S. (Renneboog & Szilagyi, 2013). Due to the institutional, cultural, and regulatory characteristics of European markets (Horster & Papadopoulos, 2019), European corporations are less likely to be targeted by shareholder proposals on environmental issues (Cziraki, Renneboog, & Szilagyi, 2010) where they rely on exogenous, government-imposed quotas, while US companies are reliant on endogenous shareholder proposals to make changes (Perrault, 2015). Hence, the U.S. is an ideal market context for the investigation of the effect of shareholder proposals on CEP.

In order to address the above objectives, this thesis analyses three quantitative studies by use of a variety of research methods and models. The three studies all begin with descriptive analysis. The first study investigates the association between WOCB and ESP and spans the years 2010 to 2018, with a final sample of 504 firms in an unbalanced panel dataset. It uses the linear probability model (LPM) with industry, company, and time fixed effects to explain the effect of WOCB on

environmental shareholders' proposals. In order to mitigate the endogeneity problem, a two-step system generalised method of moments (GMM) is used. The second study tests the mediating effect of WOCB in the relationship between ESP and CEP in the period 2010 to 2018, with 494 firms in an unbalanced panel dataset. This study uses the Sobel test, which is Baron and Kenny's stepwise model (Baron & Kenny, 1986), supplementing it with the Bootstrapping method. The third study investigates the influence of governance configurations of ESP in conjunction with WOCB, board independence, board size, institutional ownership, and institutional ownership concentration on CEP. It particularly focuses on American manufacturing industry, with a sample of 115 U.S. companies, because it has been criticised for having a large environmental footprint (Jaffe, Peterson, Portney, & Stavins, 1995). 2018 is the most recent year for available data since the signature of the Paris Climate Agreement in 2015. This study employs a 'fuzzy set' qualitative comparative analysis (fsQCA) with a quantitative element (Thomann & Maggetti, 2020), based on the set-theoretic approach (Greckhamer, Furnari, Fiss, & Aguilera, 2018).

1.5 Contributions of this thesis

The thesis addresses the impacts on CEP through an empirical lens with the intention of describing and explaining if and how environmental shareholder activism and WOCB influence CEP. Firstly, this thesis extends current

understanding in the environmental shareholder activism field, focusing on the association between environmental shareholder activism, WOCB, and CEP. Previous research regarding environmental shareholder activism and CEP primarily focuses on social movements or political constituencies (Lee & Lounsbury, 2011; Reid & Toffel, 2009), and rarely investigates the influence of the intrinsic characteristics of board members and their leadership power vis-à-vis the environment. This thesis investigates the question of whether environmental shareholder activism can improve CEP and achieve its environmental objectives with the support of corporate board members, who coherently make and direct corporate strategic decisions such as WOCB or other governance mechanisms. Further, this thesis extends and explores the current understanding of the collaboration of environmental activists towards the existence of board gender diversity and if and how they choose to work with WOCB in order to accomplish their environmental objectives with a company.

Secondly, this thesis contributes to the expansion of knowledge on the role of WOCB. Research on WOCB has rarely focused on the impact of female directors' gender traits and values on influencing the attitudes of environmental activists, or on how to achieve the aim of reducing the environmental impact of business activity. Although previous research has studied the implicit value of WOCB through the

lenses of shareholder activists, such as role incongruency in leadership, the ‘glass cliff’ dilemma, and gender discrimination (Francis et al., 2021; Gupta et al., 2018), this thesis explores how WOCB’s socially-generalised values and behaviours interact with collaborations with demanding environmental activists, contributing to the process of changing corporate environmental behaviours.

From a theoretical perspective, this thesis study applies gender socialisation theory to test the influence of female directors’ values on environmental shareholder activism and CEP. This thesis extends the feminine social-psychological theory to investigate the impact of WOCB on environmental shareholder activism and CEP. This theory illustrates the advantageous effect of socialised gender traits in collaboration with shareholder activists and environmental performance during the proposal procedure. Further, this thesis adopts a noveal configurational approach in this research field in order to obtain rich descriptions of the previous findings, thus illuminating the nuances of this complex ‘values-to-action’ phenomenon. This is likely to complement the currently meagre amount of quantitative research in this area.

From a pragmatic perspective, this study highlights the importance of the role of WOCBs in dealing with environmental shareholder activists and promoting CEP in

the context of today's severe and urgent environmental challenges, where companies are continuously confronted by a growing number of stakeholder requests and emerging environmental and stakeholder issues. This thesis underscores the significance of a values-based and holistic approach to WOCB, environmental shareholder activism, and CEP. The study also emphasises the influence of the growing power of WOCB, because women's feminine characteristics are acknowledged and enhanced by environmental shareholder activists and corporations. Suggestions are presented to legislators regarding gender quotas and legislation which takes into account not only the proportion of female directors on boards, but also the positions they hold.

There are several contributions of each study. Chapter 2 provides important empirical evidence on the effect of women's executive roles on environmental shareholder activism, taking a holistic view of how women general directors on boards, CEOs, and CEO-Chairs can influence environmental shareholder activism at different stages (ESP filed and ESP withdrawn). This study enhances gender literature by revealing that environmental activists evaluate multiple factors when targeting a corporation based on gender socialisation theory. Gender discrimination is not the primary cause. The withdrawn proposal's success shows women directors' effective communication with activist shareholder groups. This study's conclusions

would help firms promote female directors and respond to the concerns of environmental activists. The results also offer government and policymakers insights into gender policy effectiveness and the potential benefits of combining gender diversity with stakeholder engagement and environmental sustainability.

Chapter 3 contributes to gender diversity and shareholder activism literature. This study investigates the mediating effect of female directors in the relationship between WESP and CEP, depending on gender socialisation theory. In doing so, this study examines women directors' collaboration skills with shareholder activist groups on environmental problems in terms of withdrawal results. Finally, this study shows that gender diversity can mediate environmental shareholder activism and promote environmental solutions, especially in environmentally sensitive industries. It has important implications for companies, environmental shareholder activists, gender equality, policymakers, regulators, and practitioners. It can help corporations meet environmental shareholder activists' expectations and become more sustainable. Since gender diversity promotes CEP, it can also promote gender equality in the workplace. In addition to providing policymakers and regulators with information about propelling gender quotas on U.S. corporate boards, the findings also enlighten practitioners about the advancement of women board directors.

Chapter 4 contributes to the effects of ESP and governance qualities on CEP improvement and reveals the joint reliance features of ESP and other governance mechanisms that contribute to advanced CEP. In addition, this study contributes to the configurational perspective on corporate governance and CEP by using a novel analytic technique known as fsQCA. Using fsQCA opens up new research possibilities on board governance rules and CEP formulation and assessment. Lastly, academics, policymakers, and practitioners should benefit from this work, as rather than focusing on a single variable, this study examines the interplay between six key corporate governance mechanisms in different configurations of manufacturing firms.

1.6 Structure of the thesis

This thesis comprises five chapters. **Chapter 1** is the Introduction. This describes its context, rationale, aims and objectives, scope and methods, and potential contributions, as well as its structure. The first study of this thesis is presented in **Chapter 2** in order to accomplish Objective 1, which is defined in **Section 1.3**, stating the study's aims and objectives. In the aim of explaining the effect of WOCB on environmental shareholder activists' decisions with LPM and GMM models, this study draws on gender socialisation theory to examine the correlation between the

various executive roles of WOCB such as female general directors on boards, CEOs, and CEO-Chairs, and ESP at varying phases, such as ESP filed and ESP withdrawn.

Chapter 3 covers the second study of this thesis, and fulfils the second objective stated in **Section 1.3** regarding research aims and objectives. This study builds on gender socialisation theory to investigate the role of WOCB such as female general directors on boards, CEOs, and CEO-Chairs as a mediator in the relationship between WESP and eventual CEP. Mediation analysis techniques are used, including the stepwise model, the Sobel test, and the Bootstrapping test.

The third study of this thesis is presented in **Chapter 4.** It addresses Objective 3 from the research aims and objectives defined in **Section 1.3**. Unlike the previous two statistical studies, this study employs fsQCA with a quantitative technique of Boolean algebra in order to investigate the impact of ESP, WOCB, and other governance mechanism configurations on a high degree of CEP in American manufacturing companies.

Chapter 5 is the conclusion. This summarises the results of this thesis, integrates multiple data findings, evaluates the study's contributions and limitations, and identifies opportunities for further study.

2. GENDER DIVERSITY AND ENVIRONMENTAL ACTIVISM: GENDER DISCRIMINATION OR SOCIALISATION?

2.1 Introduction

This chapter aims to investigate the relationship between gender diversity on corporate boards and environmental shareholder activism. It examines the association between different executive roles taken by female directors on corporate boards and ESP at different stages based on gender socialisation theory and managerial power perspective.

Shareholder activism is a common mechanism for shareholders to exert influence over a company through the use of their voting power (Filatotchev & Nakajima, 2010; Gillan & Starks, 2000; Kuvandikov, Pendleton, & Goergen, 2022; Renneboog & Szilagyi, 2011; Smith, 1996; Yuan, Xiao, Milonas, & Zou, 2009). With environmental concerns coming to the fore, shareholder proposals have played a vital role in advancing corporate governance and highlighting the main risks of

environmental issues (Monks et al., 2004). Accordingly, ESP have been frequently filed by environmental shareholder activists to influence the environmental strategy of the targeted firms (Clark et al., 2008; O'Rourke, 2003) in which the submissions of environmental proposals on Russell 3000 Index firms have increased by 46% in 2022 (Georgeson, 2022). It shows a growing recognition from shareholder activists to address environmental concerns and it is worth to investigate shareholder activism mechanisms with relates to environmental issues.

In recent years, gender diversity research has evidenced that corporate environmental responsibilities are closely linked with gender diversity in boardrooms. For instance, Boulouta (2013) indicates that women directors are more likely to display caring and socially sensitive behaviour and improve corporate environmental and social performance. Shoham et al. (2017) emphasise the characteristics of interdependence and cooperation of women and provide evidence that WOCB are more likely to encourage boards to take new initiatives on environmental sustainability. According to Liu (2018), women directors are more sensitive and concerned with the interests of others, demonstrating gender variations in ethical decision-making and a reduction in environmental lawsuits. Gender diversity is seen as an important aspect of environmental responsibility,

hence, understanding its connection to environmental activism can contribute to building more sustainable and environmentally responsible organisations.

However, the role of female directors in the process of shareholder activism remains unclear in the existing literature. Firms face increasing pressure from the public to embrace gender diversity in corporate governance. Existing gender diversity literature reveals that women directors in top management teams face discrimination bias and are seen as weak to deal with managerial tasks compared with men (Gregory-Smith, 2018; Gupta et al., 2018; Mulcahy & Linehan, 2014; Poorhosseinzadeh & Strachan, 2021). For example, Poorhosseinzadeh and Strachan (2021) evidence men's privilege in senior positions and uncover the different forms of hegemonic masculinity. This influence has also been reflected in gender diversity on shareholder activism. Sorkin (2015) comments on *The New York Times* that "at least a quarter of them [women-led firms] has fallen into the crosshairs of activist investors." Reuters (2017) also reports that the chance of women-led firms being targeted by hedge fund activists is 54% higher than for firms with male CEOs.

There are two main streams of views that help explain the gender preference in the current gender diversity literature. One is the 'glass cliff' proposition that female CEOs receive more scrutiny than male CEOs. Gupta et al. (2018) find that even

after controlling for the precariousness of the leadership position, female CEOs face a greater public display of dissatisfaction from activist shareholders, regardless of the firms' performance. The other plausible reason has been documented by Francis et al. (2021). They suggest that unlike being self-defensive, women CEOs are more likely to communicate and cooperate with institutional activists to achieve intervention goals because women usually have stronger relationship-building and collaboration skills and are more interactive, collaborative, and engagement-oriented (Cook & Glass, 2018). However, the existing limited studies by Gupta et al. (2018) and Francis et al. (2021) have built on role congruity theory and managerial leadership style, which do not measure the actual cognitive and affective processes that lead to the gender preference in shareholder activism.

Furthermore, given institutional investors' increased focus on climate-related problems, many companies may have decided to engage with a proponent of environmental activism rather than vote on the proposal. Treviño, Hu, and Levin (2021) report that environmental proposals were withdrawn at a far higher rate in 2021 than in previous years, which implies that companies show more willingness to deal with environmental issues and are more likely to communicate privately with shareholders after encountering shareholder activism threats. As investors increasingly expect companies to address environmental issues and shareholders

have the power to influence corporate policies and actions through activism, it is important to understand to what extent companies with women's leadership in shareholder activism can help respond to environmental concerns raised by shareholders.

This study complements Gupta et al. (2018)'s research and responds to Goranova and Ryan (2014)'s call for further research that investigates the underlying processes shaping the executive director-investor interface. It aims to investigate the influence of different executive roles taken by women (woman general directors, CEO, and CEO-Chair duality) on environmental shareholder activism at different stages (filing stage and withdrawn stage) and shed light on the extent to which gender diverse corporate boards influence environmental activists' perceptions and engagement in environmental activism.

Building on gender socialisation theory and based on a sample of S&P 1500 firms from 2010 to 2018, with 504 firms and 2066 observations, this study empirically assesses the association between different executive roles taken by women directors and ESP at the filing stage first. It uses LPM as the primary test with fixed effects. As a fixed effects estimation would still yield asymptotically biassed estimates in the presence of unobserved heterogeneity or reverse causality, this

study further tests the sample with a two-step system GMM estimation and several additional tests to check the robustness of the obtained results. The empirical results show that neither women general directors nor women CEOs have a significant influence on ESP. However, there is a strongly positive correlation between women CEO–chair duality and ESP. To explore the possible reasons for such a preference, this study then examines the association between women directors in different power positions and ESP at the withdrawn stage and finds that both women CEOs and CEO-Chairs have a positively significant correlation with WESP.

The evidence suggests that the presence of general women directors could be symbolic management. Only women directors in key positions could influence environmental shareholder activists, and the impact is more pronounced in the withdrawal stage of ESP. The findings provide important evidence that environmental shareholder activists show the gender preferences during shareholder activism, and such preferences are not because of discrimination but the organisation's structural power and interpersonal skills of key female executives that enable them to collaborate with activists to achieve their environmental agenda.

This study contributes to the shareholder activism and gender diversity literature in the following ways: First, it provides important empirical evidence to the effect of

women executive roles on environmental shareholder activism. So far, studies on the gender effect and shareholder activism remain scant (Bauer, Derwall, & Tissen, 2021; Francis et al., 2021; Gupta et al., 2018; Jackson et al., 2021). Gupta et al. (2018) investigate the association between women CEOs and shareholder activism. Francis et al. (2021) specifically investigate the relationship between women CEOs and hedge fund activism. Jackson et al. (2021) complement the literature with an experimental study by investigating various investor reactions based on the CEO's gender and the way the CEO of different genders responds to shareholder activism. This study takes a holistic view in understanding how different executive roles taken by women (e.g. women general directors on boards, CEOs, and CEO-Chairs) can influence environmental shareholder activism at different stages (e.g. ESP filed and ESP withdrawn).

Second, building on gender socialisation theory and managerial power perspective, this study advances the understanding of how gender diversity affects environmental shareholder activism. It also responds to Campopiano, Gabaldón, and Gimenez-Jimenez (2022)'s call for the use of diverse theoretical perspectives and from multiple dimensions. Current literature reaches the consistent conclusion that women executives are more likely to be targeted by shareholder activism (e.g. Francis et al., 2021; Gupta et al., 2018), however, the rationale behind the

phenomenon remains unclear. Most existing literature takes the ‘glass cliff’ and discrimination bias perspective (e.g. Elsaid & Ursel, 2018; Gupta et al., 2018; Main & Gregory-Smith, 2018). However, Francis et al. (2021) argue that women directors' transformational leadership style and communicative and cooperative traits are the key reasons for the gender preference. This study advances the gender literature by showing environmental activists have multiple considerations when making the decision to target a firm especially based on gender socialisation theory, and gender discrimination is not the primary reason. Specifically, the positive results of the withdrawn proposal demonstrate women directors’ effective collaboration with activist shareholder groups.

Third, in practice, the findings of this study would aid corporations in advancing the status of women directors and addressing the concerns of an increasing number of environmental activists. In addition, the results provide evidence for government and policymakers on gender policy, where the investigation of the relationship between gender diversity and environmental shareholder activism can provide insights into the effectiveness of such policies and the potential benefits of combining gender diversity with stakeholder engagement and environmental sustainability efforts.

The remainder of the paper proceeds as follows: Section 2.2 reviews the theoretical framework. Section 2.3 discusses empirical literature review and hypotheses development. Section 2.4 describes the research design. Section 2.5 presents the empirical results and discussion, and Section 2.6 presents the summary and conclusions.

2.2 Theoretical framework

2.2.1 Gender socialisation theory

Gender socialisation theory (Chodorow, 1978; Gilligan, 1982) in feminine literature and social-psychological research contends that women and men acquire different values and social expectations from society's dominant culture beginning in childhood. For example, Zelezny and Bailey (2006) and Xiao and McCright (2015) claim that in the U.S., men are socialised to be competitive, forceful, and self-sufficient, whereas women are socialised to be more communal, caring, cooperative, altruistic and helpful. As a result, such a difference leads to the variations in value orientation (Glass & Cook, 2018). Previous research notes that gender is the potential source of variation in environmental values (Stern, Dietz, & Kalof, 1993), and gender socialisation theory is frequently employed to explain observed gender variations in environmental behaviours (Dietz et al., 2002; Xiao & McCright, 2015; Zelezny, Chua, & Aldrich, 2000).

Several studies have suggested that the differences in psychological values towards environmental concerns between men and women directors are the result of gender traits formed by the gender socialisation process (Atchison & Down, 2019; Dietz et al., 2002; Post, Rahman, & Rubow, 2011). According to Stern and Dietz (1994) and Dietz et al. (2002), altruism is a key feature of gender differences that underpins pro-environmental behaviour. They argue that women emphasise altruism more than men, depending on their "internally located response predispositions" (Spence & Helmreich, 1979, p. 1037) formed by the value of socialisation and life experience. WOCB are more concerned with environmental sustainability because they have stronger altruistic traits from socialisation. Empirical evidence supports the claim that women's proclivity for environmental sustainability is the result of socialised altruistic conduct that influences their behaviour as directors (Shoham et al., 2017). Similarly, Stern and Dietz (1994) believe that women have significant biospheric-altruistic value with regard to environmental concerns and have stronger belief that environmental degradation has negative consequences for self, others, and the biosphere. Thus, women show greater compassion and altruism for others, including the environment, than men, because many environmental issues involve harm to others.

Additionally, gender socialisation theory suggestes that women board members bring socialised qualities to the board, such as a participatory, democratic, and collaborative characteristics (Eagly et al., 2003). Management research corroborates the assumption that these socialised gender characteristics provide a variety of perspectives to the board and foster open conversation, which leads to a higher level of openness and more informed decision-making (Ben-Amar, Francoeur, Hafsi, & Labelle, 2013). Empirical evidence addresses that WOCB bring about different priorities and competing perspectives such as CSR concerns, human resources, marketing, advertisement, and ethics issues (Bear et al., 2010; Boulouta, 2013; Galbreath, 2011) into discussions based on their social experience and cognition (Kanadlı, Torchia, & Gabaldon, 2018; Nielsen & Huse, 2010; Usman, Gull, Zalata, Wang, & Yin, 2022), and they excel in encouraging environmental conversations (Post et al., 2011). Because of this, gender diverse boards may be more inclined to collaboratively and comprehensively evaluate and discuss available facts and expertise, and debate alternative views. This comprehensiveness in decision-making processes may lead to superior choices and inventiveness.

Even though the socialised qualities of women on boards could improve corporate environmental behaviour (Bear et al., 2010; Boulouta, 2013; Galbreath, 2011), it is

argued that gender diversity on corporate boards can be perceived as a symbolic move. While the presence of women indicates a visible commitment to the values of inclusion and a start towards building a more equitable workplace, it may not always result in major changes to the organisation's power dynamics or decision-making processes. The ‘glass cliff’ explains this phenomenon as that women are more likely to be promoted to executive leadership roles during times of crisis or poor financial performance, when the likelihood of failure is higher (Ryan & Haslam, 2007). In this case, female board members may play a symbolic rather than substantive role on boards because this limits their ability to have a significant impact on the organisational results, regardless of their aims or desires (Main & Gregory-Smith, 2018). As Rao and Tilt (2016) claimed, although women have different value priorities that are aligned with social responsibility, they face several challenges that restrict their ability to contribute effectively to environmental and social decisions.

In addition, organisations are subject to normative, coercive, and mimetic institutional pressures (DiMaggio & Powell, 1991). The lack of WOCB has been a concern for institutional investors, who endorse that increased diversity on boards has a positive influence on management (Bilimoria, 2000). To maintain a positive image with shareholders, companies therefore recruit more women to conform to

legitimacy and reap symbolic legitimacy benefits from the appointment of women directors (Blum, Fields, & Goodman, 1994). Moreover, in countries with gender quotas, the appointment of female directors is used as symbolic management of corporate governance practices (Main & Gregory-Smith, 2018; Martínez-García, Terjesen, & Gómez-Ansón, 2022; Nekhili, Bennouri, & Nagati, 2022). Research indicates that when there is external pressure for greater board gender diversity, an increase in the number of women directors is more likely to be a symbolic action motivated by the desire for social approval (Knippen, Shen, & Zhu, 2019). Such symbolic adoptions suggest that these companies adopt these practices in response to intense external or internal pressure and are primarily motivated by the desire for social approval (Westphal & Zajac, 1998).

Despite the potential benefits of a more diverse board brought about by gender quotas, if incumbent male directors are replaced by less competent women solely because of the gender quota requirement and other corporate legislation, shareholders could end up bearing the costs rather than benefiting from the underlying principles of these practices (Ahern & Dittmar, 2012). Accordingly, Galbreath (2010), for example, evaluates the effect of the proportion of WOCB on environmental strategies and finds little impact on the successful climate change management of corporations. With regards to environmental shareholder activism,

gender socialisation theory indicates that firms with women directors are more likely to be collaborative with shareholders on environmental issues due to their socialised communal, cooperative, and altruistic traits.

2.3 Empirical literature review and hypotheses development

2.3.1 Environmental shareholder activism and gender diversity

“Shareholder activism is understood as the attempt of shareholders to directly impact, form, or change management decisions” (Hoffmann, Brønn, & Fieseler, 2016, p. 5). One of the most popular tools for shareholder activists to achieve their goal is to submit a shareholder proposal (Hoffmann et al., 2016). In 1934, the SEC has issued Shareholder Proposal Rule 14a-8, which allows shareholders to present proposals in company proxy statements in a solicitation manner in order to voice their concerns and requires a ballot in annual general meetings (Black, 1990; Monks et al., 2004). Since then, a growing number of shareholder activists have chosen to influence company policy and act proactively on a variety of issues using shareholder proposals. Because of the degradation of the natural environment, environmental issues have become a focus of shareholder resolutions. As O'Rourke (2003) suggests that shareholder activism can be regarded as an opportunity to open up the debate on corporate environmental responsibility, environmental

shareholder activists become more active in using shareholder proposals to influence the company's environmental behaviors.

In the shareholder activism literature, most studies focus on the determinant factors of shareholder activism, such as social norms (Sjöström, 2008), regulation and media (Clark et al., 2008; Perrault & Clark, 2016), stakeholder pressure (Perrault & Clark, 2016; Sjöström, 2008), firm size (Lee & Lounsbury, 2011; Rehbein, Waddock, & Graves, 2004), firm reputation (Yang, Uysal, & Taylor, 2018), corporate financial resource (Clark et al., 2008), and board governance characteristics (Byrd & Cooperman, 2014). However, there is limited existing empirical literature investigating the association between board characteristics and environmental proposals, especially with the proposals at different stages.

Gender diversity, as one of the most important and intriguing components of board governance, plays an important role in shaping corporate social and environmental responsibility strategies (Jain & Zaman, 2020). Past empirical studies have examined the link between gender diversity and CEP, in which studies grounded in gender socialisation theory have identified that organisations with WOCB are more likely to be committed to environmental sustainability (Shoham et al., 2017), environmental responsibility (Post et al., 2011), reduced environmental misconduct,

and environmental litigation (Liu, 2018). Based on gender socialisation theory, WOCB is more likely to be associated with environmental activists attention because of the gender effect in exceling communication and collaboration with environmental shareholder activists from a social-psychological perspective.

Nevertheless, in both shareholder activism and gender diversity literature, the effect of WOCB has not been addressed in dealing with environmental shareholder activism. In this respect, this study seeks to extend the application of gender socialisation theory to gender diversity and environmental shareholder activism and specifically extend this theory to capture the cognitive and affective perceptions of environmental shareholder activists that lead to the gender preference when filing a proposal on a company. Given the above discussion, women are expected to have a positive influence over the performance of governance practices that emphasise environmental issues. Considering these factors, this study articulates the following hypothesis:

H2.1: The proportion of women general directors on corporate boards has a positively significant influence on the possibility of being targeted by environmental shareholder activists.

2.3.2 Powerful women directors

The managerial power perspective emphasises that different executives and board roles hold varying degrees of power, defined as “the capacity to alter others’ states by providing or withholding resources and administering punishments” (Keltner, Gruenfeld, & Anderson, 2003, p. 267), which makes a difference in terms of taking on corresponding responsibilities and influencing cognition and decision-making across a variety of corporate strategies and sustainable outcomes (Finkelstein, 1992; Kipnis, 1972). Torchia, Calabrò, and Huse (2011) find that CEO and chair gender has an influence on the level of organisational innovation. Magee and Smith (2013) and Johnson and Lammers (2012) find that high-powered directors attend to the needs of others and consider social comparisons when evaluating performance. Therefore, women directors in crucial positions on boards may either propel or impede strategic change and firm performance, depending on the level of power they hold (Triana et al., 2014).

This study focuses on the executive role of female directors, such as women CEOs and women CEO-Chairs, because the management has great discretion on whether and how to respond to the proposals (Dobson et al., 2018). Though existing empirical evidence regarding gender diversity and shareholder activism is scarce, there is some empirical evidence investigating the relationship between female

CEOs and shareholder activism (e.g. Francis et al., 2021; Gupta et al., 2018). The evidence shows a positively significant relationship, but none of them investigates the different powerful roles taken by female directors or the environmental perspective specifically. Furthermore, there are mixed findings about the relationship between women CEOs and environmental performance, for example, some research finds that CEO power negatively influences CSR engagement (Jia, Liao, Van der Heijden, & Li, 2022; Li, Li, & Minor, 2016). Glass et al. (2016) find no significant effect of women CEOs on environmental practice. The effect of women CEOs on environmental shareholder activism is still under-investigated.

In addition, CEO-Chair duality increases the power and accountability of the CEO (Hambrick & Finkelstein, 1987), where a firm's CEO is also the chairman of the board of directors. When the chairman and CEO are the same person, the command becomes united, eliminating role ambiguity and conflict that can occur when power is shared (Donaldson, 1990). As the chairperson's role is to foster cooperation among the board members through the adoption of an effective communication strategy that leads to board cohesiveness (Machold, Huse, Minichilli, & Nordqvist, 2011), it suggests that female CEO chairs are more likely to be democratic and interactive leaders than their male counterparts, who are more likely to be task-focused and authoritative (Eagly & Carli, 2003). Some research claims that it is

important to separate the CEO and chair roles as it may reduce the monitoring function (Jensen, 1993) and cause CEO overconfidence (Li & Tang, 2010), however, under the circumstances of environmental shareholder activism, female CEO-Chairs may be more likely to facilitate the conversation. To the best of our knowledge, there has been no evidence investigating the role of women CEO-Chairs in shareholder activism. To fill the void, this paper empirically investigates the impact of the different crucial roles of women directors on environmental shareholder activism.

Based on the managerial power perspective and gender socialisaton theory, this study expects that the increased power that comes with being a woman CEO-Chairs would strengthen their consideration of non-economic concerns, and environmental activists are therefore more inclined to start their environmental agenda with firms that have women CEOs and CEO-Chair duality. Therefore, this study claims that, no matter from a 'glass cliff' or managerial power perspective, the presence of crucial women directors is more likely to attract environmental activists' attention. The foregoing discussions lead to the following hypothesis:

H2.2a: Firms led by women CEOs are more likely to be targeted by environmental shareholder proposals (ESP).

H2.2b: Firms led by women CEO-Chairs are more likely to be targeted by environmental shareholder proposals (ESP).

2.3.3 The shift of shareholders' socialised impetus

In shareholder activism and gender diversity research, current literature reaches the consistent conclusion that women CEOs are more likely to be targeted by shareholder activism (e.g. Francis et al., 2021; Gupta et al., 2018), however, the rationale behind the phenomenon remains unclear. The most relevant literature takes the role congruity, 'glass cliff' and discrimination bias perspectives (e.g. Elsaid & Ursel, 2018; Gupta et al., 2018; Main & Gregory-Smith, 2018). For instance, Eagly and Karau (2002) find that women directors are perceived as being less congruent with leadership jobs, and firms led by women CEOs are more vulnerable to shareholder activism, owing to their lack of agentivity in comparison to males in leadership capacities. Besides, they assert that if women are appointed to top executive positions, they risk falling into a 'glass cliff' situation in which they are more likely to be chosen for risky and precarious leadership positions, increasing their likelihood of failure on the job, and thus subjecting women CEOs to greater scrutiny from activist investors than male leaders in leadership roles. Main and Gregory-Smith (2018) show that women directors face a much higher risk of

dismissal than male directors and are used in the symbolic management of corporate governance. In addition, Gupta et al. (2018) assert that a successful leader is often linked with masculine characteristics and find that women CEOs receive more activist targeting than male CEOs because of the prevalent gender prejudice and incompatible leadership characteristics. Nonetheless, Francis et al. (2021) discover that the persistence of a ‘glass cliff’ and gender discrimination bias do not explain the gender effect in hedge fund activism. Instead, they find that women directors' transformational leadership style and communicative and cooperative traits provide a plausible explanation. None of the existing literature has addressed the actual cognitive and affective processes that lead to the gender preference in environmental shareholder activism.

Since environmental issues are not part of the core business of a company and are not directly linked with corporate profit maximisation, the rationale and logic behind environmental shareholder activism could be different from that of shareholder activism with financial goals. According to gender socialisation theory, the altruistic value of social generalisation enables women directors to be environmentally friendly. Moreover, the feminine traits in women, such as the value of an inclusive and participatory approach to leadership, would allow them to be seen as a better fit for managerial positions because they are open to opinions (Rudman & Glick,

2001). Empirical evidence also reveals that WOCB show an empathetic orientation towards relationship building and maintenance (Glass & Cook, 2018), have a lower social dominance orientation, and focus more on the maintenance and stability of group-based social hierarchies (Milfont & Sibley, 2016). These traits in women would contribute to greater awareness and commitment to the needs of environment-related stakeholders as well as shareholders.

Except for being omitted due to violation of the SEC's rules, before getting into the voting process at the annual general meeting, the proposal could be withdrawn by activists (O'Rourke, 2003). Notably, the withdrawal of a submitted proposal demonstrates the success of shareholder activists because it signals that the company has engaged in dialogue, reached an agreement, or made a compromise on the resolution (Graves et al., 2001; Tkac, 2006). Consequently, companies will be more likely to implement and adjust their behaviour in the future (Byrd & Cooperman, 2014). For example, if the proposal comes to a withdrawal process, it means that the company shows a willingness or commitment to negotiate on the issue, such as by giving a written commitment to take steps on environmental performance and demonstrating a high level of cooperation (O'Rourke, 2003).

Existing studies largely focus on voted shareholder proposals and do not capture the influence of withdrawn proposals. Empirically, only Bauer et al. (2021) provide evidence that the withdrawal of an environmental shareholder proposal succeeds in improving environmental performance. They examine whether boards with a greater percentage of women directors are more likely to agree with shareholders on environmental issues, which might result in the increased withdrawal of environmental proposals. However, they do not reject the null hypothesis and conclude that women general directors have no effect on the likelihood of withdrawal. Combining gender socialisation theory and the managerial power perspective, this study posits that only women directors in key positions are more likely to attract the attention of environmental shareholder activists, promote effective communication with environmental activists, and show the openness and readiness to move towards a withdrawal outcome in order to achieve environmental agreement. As a result, the following is hypothesised:

H2.3a: Firms led by women CEOs are more likely to reach withdrawal decisions on environmental shareholder proposals.

H2.3b: Firms led by women CEO-Chairs are more likely to reach withdrawal decisions on environmental shareholder proposals.

2.4 Research design

2.4.1 Sample construction

The initial dataset includes shareholder resolutions filed on S&P 1500 firms in the U.S. between 2010 and 2018, taking into account the influence of the 2020 Women on Boards Campaign, which began in the U.S. in 2010. Voting results are obtained from the Shareholder Proposal S&P 1500 database in the Institutional Shareholder Services (ISS) database, which accesses proposals that came to vote, being withdrawn or omitted from the proxy by the SEC. Data with filed resolutions and voting results from within this period were explicitly selected regarding natural environment issues and keywords (see details in Appendix A). Due to data availability, the final sample is an unbalanced panel dataset that runs from 2010 to 2018 with 504 firms and 2066 observations (see details in Appendix B). The vast majority of resolutions are presented and updated each year. Firms in the sample could receive one or more proposals in multiple years but do not always receive an environmental proposal each year.

2.4.2 Model specification

This study uses LPM (Adams & Ferreira, 2009; Huang & Kang, 2017; Sila, Gonzalez, & Hagendorff, 2016) with industry, company, and time fixed effects to explain the impact of WOCB on the probability of receiving and withdrawing ESP. The reasons to choose the LPM method are that: (1) It is more robust to heteroscedasticity in the error term because it can control company heterogeneity and any other unobservable company characteristics (Adams & Ferreira, 2009). (2) It provides coefficients that are directly interpretable as marginal effects or probabilities and is computationally efficient as it relies on OLS estimation. The year and industry fixed effects are employed based on the two-digit NAICS code. This study also conducts the Durbin-Wu-Hausman specification test to confirm the choice of fixed effects over random effects, which is robust under heteroskedasticity (Semykina, 2012; Sila et al., 2016). Furthermore, this study uses robust standard errors in all panel data models (Carter, D'Souza, Simkins, & Simpson, 2010).

Previous literature uses non-linear models such as the Logit model (Dimitrov & Gao, 2017), the Probit model (Iliev, Lins, Miller, & Roth, 2015), and the Tobit model (Liu, 2018) when the dependent variable is binary. Consistently, this study tests the sample in Logit regression with fixed effects (Dimitrov & Gao, 2017), Tobit regression (Liu, 2018) with left-censoring dependent variables, and Probit

regression (Iliev et al., 2015) based on previous literature to predict whether a firm has at least one ESP filed or withdrawn. However, those methods have limitations with our sample. For example, using Logit regression with a fixed-effects model caused 624 observations to drop because of consistently positive or negative outcomes. Fixed effects cannot be applied to the Tobit and Probit models, while controlling for year and industry may cause estimation bias.[2] So, we chose to estimate the regression primarily using LPM in order to control for fixed effects and mitigate the concern of omitted firm characteristics (Huang & Kang, 2017).

Reverse causality and endogeneity are potential concerns for the empirical analysis. Women directors and executive appointments may not be randomly determined. According to the 'glass cliff' phenomenon, women directors might be appointed to be executives in companies that are in a risky condition (Ryan & Haslam, 2007). It gives rise to the problem of reverse causality when firms are under the threat of shareholder activism. To address potential reverse causality issues, this study employs panel estimations and one-year lagged independent variables, as well as one-year lagged control variables (Joecks, Pull, & Vetter, 2013; Liu, 2018).

[2] Using Probit and Tobit regressions with the approach of controlling the industry and year dummies to control the year and industry effects does not change the results.

Given the above discussion, the central hypothesis was tested by the following regression equation in this study.

$$y_{i,t} = \beta_0 + \beta_1 Women_{i,t-1} + \beta_2 Profitability_{i,t-1} + \beta_3 Leverage_{i,t-1} + \beta_4 Size_{i,t-1} + \beta_5 Board\_Size_{i,t-1} + \beta_6 En\_Committee_{I,t-1} + \beta_7 En\_score_{i,t-1} + \beta_8 Sponsor_{i,t} + \beta_9 TDC1_{i,t-1} + \beta_{10} Ibh\_5pct_{i,t-1} + ai + \sum_t^i Industry + \sum_t^i Year + \sum_t^i Company + \varepsilon_{i,t}$$

Where the subscript *i* refers to the firm number and the subscript *t* denotes the time period, the dependent variable ($y_{i,t}$) is either environmental shareholder proposals filed or environmental shareholder proposals withdrawn by shareholder activists at the firm *i* in time *t*; β_0 is a constant; β_1 - β_{10} are the parameters for the explanatory variables; a_i show unobserved time-invariant firm effects; *Women* refers to women general directors excluding women CEOs, women CEOs or women CEO-Chairs; *Profitability* refers to firms' profitability ratio; *Leverage* represents the firm's leverage ratio; *Size* refers to firm size; *Board_Size* denotes the board size; *En_Committee* represents an environment-related committee set up in the firm; *En_score* represents the corporate environmental performance; *Sponsor* is the institutional sponsor type for environmental proposal submissions; *TDC1* is directors' total compensation; *Ibh_5pct* refers to the institutional blockholder ownership ratio;

Industry is industries sorted by a two-digit NAICS code; *Company* denotes the number of firms; *Year* is the time trend, and ($\varepsilon_{i,t}$) is the error term.

2.4.3 Dependent variables

Shareholder activism. Shareholder proposal is one of the most common and active approaches for shareholder activists (Rojas et al., 2009), hence, this study uses shareholder proposal as a proxy for the dependent variable. As both filing proposals and withdrawn proposals indicate a certain level of success, this study considers the status of an environmental resolution, including being filed (ESP) and being withdrawn (Withd_ESP). A dummy variable takes the value 1 if there is at least one proposal filed or withdrawn for a given firm in a given year, and 0 otherwise, following Gupta et al. (2018), Francis et al. (2021) and Bauer, Moers, and Viehs (2015). The presence of ESP shows that shareholder activists make efforts to influence the company's environmental behaviour, while the presence of WESP shows that shareholder activists show willingness to communicate and reach a certain agreement with the management regarding environmental issues.

2.4.4 Independent variables

Gender diversity. The independent variable in this study is gender diversity. This study conducts a thorough investigation into the power of gender diversity among corporate board members, so three independent variables are measured: (1) The percentage of women general directors (WOCB) is used to measure the level of gender diversity on boards (Atif, Alam, & Hossain, 2020; Cordeiro, Profumo, & Tutore, 2020; He & Jiang, 2019) because percentages have more explicative and comparative power than absolute numbers (Pucheta-Martínez & Bel-Oms, 2019). The ratio of WOCB is measured as the percentage of the number of women general directors that exclude female inside CEO to the total number of board directors, and such measurement is proxied for the influence of general female directors without inside executive power; (2) the binary variable of women executive directors (F_CEO) (Atif et al., 2020; Gupta et al., 2018; Shahab et al., 2020) is used to measure the crucial power of female directors; and (3) women CEO-Chairs (F_Dua) is used to measure the strengthened power held by female directors with more responsibilities (Bennouri, Chtioui, Nagati, & Nekhili, 2018; Kyaw, Treepongkaruna, & Jiraporn, 2022; Nadeem, Zaman, & Saleem, 2017).

2.4.5 Control variables

Firm size. Firm size is one of the most significant determinants of shareholder initiatives linked to activism. This study measures firm size by a natural logarithm of total assets (Galbreath, 2017). A larger firm size is expeted to have a higher possibility of being targeted by shareholder proposals because larger firms have more resources to invest in innovative activities (Juo & Wang, 2022) and are more likely to attract attention from environmental activist shareholders and have a higher capital outlay on environmental actions (Stathopoulos & Voulgaris, 2016). Therefore, this study expects a positive relationship between firm size and the possibility of being targeted.

Profitability. Following Gupta et al. (2018), profitability is measured by the ratio of earnings before interest and taxes (EBIT) to total assets. According to Haslam and Ryan (2008) and Francis et al. (2021), activists are more likely to target companies where women are in leadership positions if such companies are less profitable than average. Hence, firms with poor operating or market performance are more likely to be the focus of environmental shareholder activists and attract more public attention from activists (Ryan & Haslam, 2007), and a negative relationship between profitability and the possibility of being targeted is expected.

Leverage. Leverage is measured as the ratio of long-term debt to total assets (Gupta et al., 2018). Firms with weak leverage cause financial difficulty and may lead companies to prioritise short-term financial gains over long-term sustainability objectives. This condition increases the probability of receiving activist attention, and a negative relationship between leverage and the possibility of being targeted is expected.

Corporate environmental performance. Corporate environmental performance is measured by the value of environmental scores from the Asset 4 ESG Score database (Kassinis et al., 2016). The environmental score covers the categories of emissions, innovation, and resource use (Refinitiv, 2020). Environmental activists would target companies with poor environmental performance as they seek to influence the firm's environmental practices, so a negative relationship between CEP and the possibility of being targeted is expected.

Environmental committee. The purpose of the environmental committee is to plan, implement, and review sustainability policies and activities (Liao, Luo, & Tang, 2015). It may enhance the company's awareness of environmental responsibility, provide environmental information to the board, and make the company more inclusive to the environment when the company engages with shareholder activists.

However, Berrone and Gomez-Mejia (2009) find that environmental committees are symbolic rather than instrumental as they do not have efficacy. Therefore, the expected relationship is uncertain.

Board size. The board's size is determined by the number of directors on the board. Research finds that board size negatively affects firm innovation (Zona, Zattoni, & Minichilli, 2013), and larger boards may slow down decision making and harm board effectiveness (Judge & Miller, 1991). As a result, it may influence shareholder activists' decisions and decrease the possibility of being targeted by shareholder activists because it may not contribute to environmental practices. Therefore, a negative relationship between board size and the possibility of being targeted is predicted.

Total compensation. This study uses TDC1 from Execucomp to measure the total executive compensation. It is the logarithm of the sum of salary, bonus, the total value of restricted stocks and stock options granted during the fiscal year, long-term incentive payouts, and all other compensation (Harris, Karl, & Lawrence, 2019). This study controls total compensation because the directors' insight and performance may be affected by compensation sensitivity (Levit & Malenko, 2011). Therefore, it

would be attractive to environmental shareholder activists, and their relationship is expected to be positive.

Sponsor type. This study uses a binary variable to determine if institutional investors (excluding individual investors) propose an environmental shareholder proposal to the company to measure the influence of institutional investors' actions in activism (Flammer et al., 2021). Bauer et al. (2015) show that institutional investors increase the likelihood of shareholder proposals because they may be able to engage in activism more actively because of their ownership stake and status (Ferreira, Massa, & Matos, 2010). Therefore, their relationship is expected to be positive.

Institutional blockholder ownership. Institutional blockholder ownership is measured as the ownership of institutional blockholders (>5%) in the percentage of market capitalisation at the year's end (Gine, Moussawi, & Sedunov, 2017). It indicates the portion of a company's shares held by institutional investors who own more than 5% of the outstanding shares. Research documents that institutional blockholder ownership reduces informational asymmetries and increases firm investment (Lev & Nissim, 2003), and firms with greater institutional ownership are associated with more innovation (Aghion, Van Reenen, & Zingales, 2013). Hence, firms with a higher institutional blockholder would have less attention from activists as they have

already been supervised by blockholders. As a result, a negative relationship is expected between institutional blockholder ownership and the possibility of being targeted.

2.5 Empirical results and discussion

2.5.1 Descriptive statistics and correlations

Descriptive statistics of dependent, independent, and control variables are presented in Table 2.1. As the main dependent variables, ESP and Withd_ESP, are binary variables equaling 1 if a firm has at least one proposal filed or withdrawn for a sample firm in a given year and 0 otherwise, the results in Table 2.1 indicate that the filed ESP has a mean of 0.287 (standard deviation of 0.452) and the withdrawn ESP has a mean of 0.150 (standard deviation of 0.357). It suggests that, on average, around 29% of the sample has received at least one filed ESP, and around 15% of the sample has withdrawn at least one ESP. These results are consistent with other environmental shareholder resolution studies (Flammer et al., 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009).

The average gender diversity in the sample firms is 18.6%, with a standard deviation of 9.6%. The result indicates a low representation of women holding board positions in the U.S. between 2010 and 2018. Though the highest proportion is larger than half, there are still some companies without women directors since the minimum number is 0. Table 2.1 shows that, on average, U.S. boards have around 11 directors (10.660). About 5.1% of firms have female CEOs who are also board members, and 2.7% of firms have female CEOs who are also the chairman of the

board. The institutional blockholders who hold more than 5% of the shares in the company have a proportion of 13.6% of the total shares. About 80.8% of the environmental shareholder proposals are sponsored by institutional investors. Finally, about 4.2% of the firms have an environmental committee.

Pearson correlations are reported in Table 2.2. As expected, both ESP and Withd_ESP are positively correlated with WOCB, women CEOs, and positively significant with women CEO-Chairs on corporate boards, indicating that firms with women duality are more likely to receive ESPs. For more details about the frequency of filed and withdrawn ESP each year, see Appendices C and D. Overall, the low degree of correlation observed between variables gives little cause for multicollinearity diagnoses. This is also confirmed by the analysis of the variance inflation factor (VIF) values, where the maximum VIF value is 2.69 and the mean VIF is 1.50 (see Apendix E).

Table 2.1 Sample descriptive statistics

Variables	N	mean	sd	min	max
ESP	2,066	0.287	0.452	0	1
Withd_ESP	2,066	0.150	0.357	0	1.000
WOCB	2,066	0.186	0.096	0	0.583
F_CEO	2,066	0.051	0.221	0	1
F_Duality	2,066	0.027	0.162	0	1
Size	2,066	9.746	1.355	5.631	14.660
Profitability	2,066	0.109	0.088	-1.375	0.634
Leverage	2,066	0.300	0.242	0.000348	3.852
TDC1	2,066	8.390	0.655	5.700	11.16
Board_Size	2,066	10.660	2.091	4	34
Ibh_5pct	2,066	0.136	0.098	0	0.570
En_score	2,066	46.320	28.420	0	98.510
En_Committee	2,066	0.042	0.200	0	1.000
Sponsor	2,066	0.808	0.394	0	1.000

This table presents descriptive statistics for variables. The data is panel data for an unbalanced sample of 2066 firm-year observations for 2010–2018. Not all firms have data for all years. All variables are defined in Appendix F.

Table 2.2 Pairwise correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) CESP	1.000														
(2) Withd_CESP	0.662***	1.000													
(3) WOCB	0.009	0.014	1.000												
(4) F_CEO	0.032	0.026	0.065***	1.000											
(5) F_Duality	0.085***	0.055**	0.045**	0.718***	1.000										
(6) Size	0.188***	0.075***	0.209***	0.083***	0.113***	1.000									
(7) Profitability	-0.046**	-0.038*	-0.011	-0.023	-0.027	-0.187***	1.000								
(8) Leverage	0.017	-0.042*	-0.056**	-0.030	-0.012	-0.210***	0.243***	1.000							
(9) TDC1	0.062***	-0.008	0.120***	0.089***	0.077***	0.597***	0.056**	-0.130***	1.000						
(10) Board_Size	0.055**	0.006	0.070***	0.044**	0.057***	0.486***	-0.089***	-0.120***	0.256***	1.000					
(11) Ind	0.016	0.020	0.226***	0.032	0.069***	0.232***	-0.058***	-0.063***	0.078***	0.133***	1.000				
(12) Ibh_5pct	-0.135***	-0.076***	-0.036*	0.055**	0.046**	-0.466***	-0.045**	0.140***	-0.299***	-0.293***	-0.086***	1.000			
(13) En_score	0.122***	0.060***	0.256***	0.105***	0.100***	0.564***	0.021	-0.126***	0.395***	0.386***	0.258***	-0.358***	1.000		
(14) En_Committee	0.072***	0.048**	0.004	0.072***	0.055**	0.057***	-0.124***	0.002	-0.062***	0.072***	0.078***	-0.024	0.049**	1.000	
(15) Sponsor	0.298***	0.205***	-0.063***	-0.004	0.028	0.135***	-0.022	0.022	0.087***	0.044**	-0.088***	-0.119***	0.085***	-0.009	1.000

*** p<0.01, ** p<0.05, * p<0.1

2.5.2 Main results and discussion

Table 2.2 presents the Pearson correlation. The sample consists of 2066 firm-year observations for the period 2010–2018. All variables are defined in Appendix F. To test the hypothesis, this study first runs the LPM regression with fixed effects, the Durbin-Wu-Hausman specification test (Hausman, 1978), and standard errors clustered by firms. This study chooses to use fixed effects because the results of the Hausman specification tests are significant. This study teases out the effects of women general directors, women CEOs, and women CEO-Chairs on ESP filed and withdrawn in Table 2.3 with the LPM model.

In Column 1 of Table 2.3 with filed ESP as the dependent variable, WOCB is positively correlated but has no statistical significance on the ESP filed. This does not support Hypothesis 2.1 that the proportion of women general directors on corporate boards has a positively significant influence on the possibility of being targeted by environmental shareholder activists. Despite the fact that, according to gender socialisation theory, women directors are sensitive to the environment and play an essential role in the implementation of environmental strategies, the prevalence of gender stereotypes in the workplace cannot be ignored (e.g. Elsaid & Ursel, 2018; Main & Gregory-Smith, 2018). The positive relationship indicates that environmental shareholder activists have confidence in women general directors,

whereas the absence of a significant relationship indicates their scepticism regarding the abilities of women general directors.

When this study tests the influence of women directors in positions of power, it finds that there is no significant influence from women CEOs on ESP filed in Column 2, indicating that Hypothesis 2.2a that firms led by women CEOs are more likely to be targeted by environmental shareholder proposals (ESP) is not supported. This result differs from shareholder activism studies (Francis et al., 2021; Gupta et al., 2018), but as this study focuses on environmental aspects, it is not surprising that environmental shareholder activists have greater environmental-related requirements and expectations of directors and that the role of a woman CEO may not convince them that it is advantageous to their requests.

The result shows that women CEO-Chair duality (F_Duality) ($\beta = 0.273$, $p < .01$) is positively and significantly associated with ESP filed in Column 3, supporting Hypothesis 2.2b that firms led by women CEO-Chairs are more likely to be targeted by environmental shareholder proposals (ESP). Following Magee and Smith (2013) and Johnson and Lammers (2012), when evaluating performance, powerful directors attend to the requirements of others and consider social comparisons. The results indicate that the possibility of filing an ESP increases only when women take

significant positions on corporate boards, as predicted under the gender socialisation theory and managerial power perspective.

To explore the rationale of gender preference as gender discrimination or socialisation, this study further investigates gender preference at the withdrawal stage. In the model with ESP withdrawn as a dependent variable, Column 4 shows that women CEOs (F_CEO) ($\beta = 0.225$, $p < .05$) is positively and significantly associated with WESP, which is in support of Hypothesis 2.3a that firms led by women CEOs are more likely to reach withdrawal decisions on environmental shareholder proposals. As predicted in this study, the shareholders' socialised impetus would shift away from the prevalent workplace stereotype in the event of withdrawing proposals because the withdrawal of a submitted proposal indicates a certain level of agreement or communication between management and shareholder activists (Tkac, 2006), which requires the management to show willingness to collaborate. Under this circumstance, gender socialisation theory explains the rationale behind the gender effect, as women directors with socialised gender traits contribute to relationship building and maintenance as well as a greater awareness and commitment to the needs of environmental-related shareholders. Combined with the managerial power perspective, female directors with power would attract the attention of environmental activists.

Column 5 of Table 2.3 reports that women CEO-Chair duality (F_Duality) ($\beta = 0.286$, $p < .01$) is positively and significantly associated with ESP withdrawn from the corporation, in support of Hypothesis 2.3b that firms led by women CEO-Chairs are more likely to reach withdrawal decisions on environmental shareholder proposals. Regarding WESP, the possibility modestly increases with women CEOs on corporate boards and significantly increases with women CEO-Chair duality. The findings indicate that corporations with a woman CEO-Chair on the board are more appealing to environmental activists and the effect is more pronounced at the withdrawal stage. The findings are consistent with gender socialisation theory and the managerial power perspective, showing that women CEOs at the withdrawal stage and women directors with the most significant power (e.g. CEO-Chairs) at both the filed and withdrawn stages can influence the decisions of environmental shareholder activists. It suggests that the mere presence of women in board director positions may not be sufficient for addressing environmental shareholder activism issues when a gender policy is being considered in law or in a company, as these women directors with crucial roles inspire the trust of environmental shareholder activists.

Regarding the control variables, the majority of them are consistent with previous predictions. Profitability, leverage, environmental committee, and sponsor type are statistically significant for filed ESP. As anticipated, poorly profitable and low-leverage firms attract the attention of environmental shareholder activists because their poor financial condition may lead shareholders to assume that the company will prioritise short-term interests over long-term growth (Ryan & Haslam, 2007). It is found that there is a negative correlation between environmental committees and the likelihood of being targeted, which is not surprising given that if a corporation has an environmental committee, environmental activists may be less concerned. While board size, total compensation, and sponsor type are statistically significant for WESP. In the WESP process, more communication is required. The relationship between board size and WESP is negative and statistically significant (Judge & Miller, 1991), and it could be that a larger board size may slow down the decision-making process and induce conflicting perspectives. As expected, total compensation has a positive correlation with WESP, as directors with higher compensation are more perceptive (Levit & Malenko, 2011). Sponsor type has a highly positive and significant association with both ESP types. It demonstrates that environmental activists pay close attention if institutional investors were the previous sponsors of ESP due to their status and influence. The insignificance of the other control variables is consistent with the expected sign direction, indicating that they are not sufficient to generate significance.

The findings show that only a board with women directors in the most powerful positions, such as women duality, influences the possibility of an ESP being filed. This could be due to the fact that environmental issues are not part of the core business of the company. According to the ‘glass cliff’, women executives are usually appointed to boards that are contemporaneously experiencing underperformance or other turmoil, and the career prospects of such an appointment are more risky (Main & Gregory-Smith, 2018). So, women CEOs may focus more on the financial goals of the firms, while women CEO-Chairs have more legitimate power over environmental issues. A powerful woman director may also mitigate the effect of gender discrimination prevailing in job positions (Cejka & Eagly, 1999). Moreover, environmental activists, who have the need to change the practices of the company, are more likely to make a withdrawal decision when there is a woman CEO or woman CEO-Chairs on board who exhibits feminine traits of communicativeness and is more likely to negotiate and take further steps on environmental issues.

Table 2.3 LPM model with fixed effects for ESP filed and WESP with Sargan-Hansen test

		ESP		WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	0.012				
	(0.05)				
F_CEO		0.059		0.225**	
		(0.66)		(2.25)	
F_Duality			0.273***		0.286***
			(4.35)		(3.12)
Profitability	-0.471**	-0.467**	-0.477**	-0.237	-0.261
	(-2.12)	(-2.10)	(-2.17)	(-0.94)	(-1.03)
Leverage	-0.204**	-0.205**	-0.206**	-0.196	-0.194
	(-2.07)	(-2.09)	(-2.10)	(-1.51)	(-1.49)
Size	0.099	0.100	0.100	0.048	0.044
	(1.57)	(1.61)	(1.61)	(1.12)	(1.05)
Board_Size	-0.019	-0.019	-0.019	-0.018*	-0.017
	(-1.54)	(-1.56)	(-1.56)	(-1.66)	(-1.56)
En_Committee	-0.314*	-0.328*	-0.358*	-0.116	-0.107
	(-1.88)	(-1.86)	(-1.89)	(-0.71)	(-0.65)
En_score	-0.002	-0.002	-0.002	0.000	-0.000
	(-1.42)	(-1.40)	(-1.48)	(0.16)	(-0.01)
TDC1	0.008	0.009	0.007	0.055*	0.052*
	(0.27)	(0.29)	(0.24)	(1.85)	(1.73)
Ibh_5pct	-0.076	-0.090	-0.085	-0.300	-0.255
	(-0.29)	(-0.35)	(-0.33)	(-1.29)	(-1.10)
Sponsor	0.235***	0.235***	0.235***	0.150***	0.148***
	(6.70)	(6.69)	(6.75)	(5.56)	(5.62)
Constant	-0.561	-0.575	-0.557	-0.646	-0.587
	(-0.93)	(-0.95)	(-0.92)	(-1.26)	(-1.14)
Observations	1,364	1,364	1,364	1,364	1,364
R-squared	0.066	0.066	0.070	0.054	0.052
Sargan-Hansen	YES	YES	YES	YES	YES
Chi-sq	0.000***	0.000***	0.000***	0.000***	0.000***
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Company FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the LPM with industry, year, and company fixed and standard errors clustered, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in

parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

2.5.3 Robustness checks

This study carries out a number of analyses to ascertain the results' robustness. First, to minimise endogeneity problems, this study applies a well-developed two-step system GMM model (Blundell & Bond, 1998), which is considered the best estimation using internal instruments to deal with shorter panel data sets (Flannery & Hankins, 2013) and more robustly contro for endogeneity. Prior to using this estimation, this study performs several tests for the validity of system GMM instruments, which include the Sargan and Hansen test of overidentification and the Arellano-Bond test for second-order serial correlations AR(1) and AR(2) (Arellano & Bond, 1991; Hansen, 1982; Sargan, 1958).

Considering the evidence that past shareholder proposals influence the possibility of proposals targeted in the current year, this study proceeds with the estimation of the system GMM model in Table 2.4. The instrument validity test results are reported in the last few rows. This study tests AR(1) for autocorrelations and found no significant second-order serial correlations in AR(2). The Hansen test suggests that all instruments are exogenous. Similarly, there is no evidence in the analyse that

WOCB has an effect on ESP filings. The results consistently show that women CEO-Chairs (F_Duality) (β = 0.398 p < .05) is statistically significant with ESP filed at the 5% level. Moreover, women CEOs (F_CEO) (β = 0.576, p < .1) is statistically significant correlated to WESP at the 10% level, and women CEO-Chairs (F_Duality) (β = 0.362, p < .05) is statistically significant correlated to WESP and significant at the 5% level. Overall, the results are consistent with the test in the LPM fixed effect model.

Table 2.4 Two-step system GMM model for ESP filed and WESP

	ESP			WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	-0.306				
	(-0.69)				
F_CEO		0.284		0.576*	
		(1.12)		(1.78)	
F_Duality			0.398**		0.362**
			(2.23)		(1.99)
Controls	YES	YES	YES	YES	YES
Observations	1,364	1,364	1,364	1,364	1,364
Number of N	332	332	332	332	332
Year dummies	YES	YES	YES	YES	YES
AR1 p-value	0.000***	0.000***	0.000***	0.000***	0.000***
AR2 p-value	0.757	0.557	0.629	0.185	0.767
Hansen test p-value	0.650	0.688	0.266	0.599	0.592

This table presents the results of the GMM models examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Second, this study runs the equation using the pooled ordinary least squares (OLS) regression and industry, year, and company fixed effects with the Driscoll-Kraay standard errors (DKSE) approach (Driscoll & Kraay, 1998; García Martín & Herrero, 2020; Hoechle, 2007; Jiang & Akbar, 2018) in Table 2.5. This approach is appropriate for panel data with a time-series cross-section structure, and it helps to control a higher-order autocorrelation process by incorporating the influence of lag-dependent variables, such as lagged ESP, in independent variables and specifying the lag structure for control. Especially, the Driscoll-Kraay standard errors (DKSE) approach is employed to address potential violations of the assumption of independent and identically distributed errors. In panel data analysis, the error terms may exhibit correlation or heteroscedasticity. The DKSE method allows the estimation of robust standard errors that are adjusted for potential correlation or heteroscedasticity in the error terms, resulting in more reliable and efficient standard errors (Atchison & Down, 2019). Therefore, this approach is employed as a robustness test because it yields more accurate standard errors that account for potential correlation and heteroscedasticity, resulting in more reliable statistical inference and enhancing the validity of the empirical results.

In Table 2.5, the DKSE regressions have achieved similar results to the main test. Specifically, there is no significance for WOCB and women CEOs regarding ESP

but a strong correlation for women CEO-Chair duality (F_Duality) (β = 0.287, p < .01) as reported by Columns 1, 2, and 3 in Table 2.5. As reported in Columns 4 and 5, the result is consistent: women directors with crucial positions on corporate boards are statistically significant on withdrawn proposals. Besides, the estimated coefficient increases while women directors take more pivotal positions, which indicates a rising effect on WESP for women CEOs (F_CEO) (β = 0.238, p < .05) and women CEO-Chair duality (F_Duality) (β = 0.310, p < .01). The coefficients show that the presence of women CEO-Chair duality on corporate boards has the most influential effects on both stages of ESP.

Table 2.5 Robustness test for DKSE models with ESP filed and WESP

	ESP			WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	0.139				
	(0.98)				
F_CEO		0.067		0.238**	
		(1.65)		(2.59)	
F_Duality			0.287***		0.310***
			(5.08)		(3.86)
Constant	-0.751**	-0.793**	-0.744**	-0.686**	-0.637**
	(-2.48)	(-2.95)	(-2.74)	(-2.74)	(-2.80)
Controls	YES	YES	YES	YES	YES
Observations	1,364	1,364	1,364	1,364	1,364
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Company FE	YES	YES	YES	YES	YES

This table presents the results of the DKSE models with industry, year, and company fixed, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Third, due to the problem that linear probability regressions with fixed effects can overstate statistical significance with singleton groups maintaining, the multi-level fixed effects model is used to exclude groups containing only one observation as a robustness check (Correia, 2015, 2016). Table 2.6 shows the results of linear regression absorbing multiple levels of fixed effects and indicates consistent results. This model absorbs firm fixed effects and year-industry fixed effects with standard errors clustered by firms. After applying this model, 76 singletons are dropped due to singleton groups maintaining. The results in Table 2.6 show consistent results with those in Columns 3 and 5, where women directors with the most potent power on corporate boards have the greatest possibility of having ESP filed (F_Duality) ($\beta = 0.273$, $p < .01$) and withdrawn (F_Duality) ($\beta = 0.286$, $p < .01$). Women directors with no vital positions, on the other hand, show an insignificant association with both ESP in Columns 1 and 2, but a significantly positive association with WESP (F_CEO) ($\beta = 0.225$, $p < .05$) in Column 4.

Table 2.6 Robustness test for multi-level fixed effect model with ESP filed and WESP

		ESP		WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	0.012				
	(0.05)				
F_CEO		0.059		0.225**	
		(0.65)		(2.23)	
F_Duality			0.273***		0.286***
			(4.32)		(3.09)
Controls	YES	YES	YES	YES	YES
Observations	1,288	1,288	1,288	1,288	1,288
R-squared	0.532	0.532	0.534	0.329	0.328
Sargan-Hansen	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year#Industry FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the multi-level models using REGDFE with firm, year, and industry fixed, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Fourth, the dependent and independent variables are estimated using additional variables. As an alternative robustness measure, it controls for the absolute number of both ESP and WESP (Gupta et al., 2018; Lee & Lounsbury, 2011). Since the LPM and DKSE models are designed specifically for binary dependent variables, the multi-level fixed effects model is used to test continuous dependent variables. The results are similar and shown in Table 2.7. As a robustness test for the independent variable, this study employs the absolute value of the number of women general

directors (Atif et al., 2020; He & Jiang, 2019). The results hold and shown in Table 2.8.

Table 2.7 Robustness test for alternative measure of dependent variables

	Total number of ESP			Total number of WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	-0.611				
	(-1.33)				
F_CEO		0.120		0.112*	
		(0.83)		(1.79)	
F_Duality			0.334*		0.169***
			(1.77)		(3.08)
Control variables	YES	YES	YES	YES	YES
Observations	1,364	1,364	1,364	1,364	1,364
R-squared	0.201	0.200	0.202	0.108	0.109
Sargan-Hansen	YES	YES	YES	YES	YES
Year#Industry FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the multi-level models using REGDFE with firm, year, and industry fixed, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2.8 Robustness test for alternative measure of independent variable

		ESP		WESP	
Variables	(1)	(2)	(3)	(4)	(5)
numWOCB	0.004				
	(0.15)				
F_CEO		0.059		0.225**	
		(0.66)		(2.25)	
F_Duality			0.273***		0.286***
			(4.35)		(3.12)
	(5.39)	(6.69)	(6.75)	(5.56)	(5.62)
Control variables	YES	YES	YES	YES	YES
Constant	-0.543	-0.575	-0.557	-0.646	-0.587
	(-0.65)	(-0.95)	(-0.92)	(-1.26)	(-1.14)
Observations	977	1,364	1,364	1,364	1,364
R-squared	0.063	0.066	0.070	0.054	0.052
Number of N	245	332	332	332	332
Sargan-Hansen	YES	YES	YES	YES	YES
Chi-sq	0.000***	0.000***	0.000***	0.000***	0.000***
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the LPM with industry, year, and company fixed and standard errors clustered, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Lastly, this study winsorises all the data at the 1% and 99% levels to determine whether the results are sensitive to the winsorisation operation (Moussa, Allam, Elbanna, & Bani-Mustafa, 2020). The results have not changed and shown in Table 2.9. In addition, this study estimates models without the control variable of profitability because, due to the availability of data, profitability-containing models

caused 48 firms to decline. This study's findings remain unchanged when this subsample of data is used and shown in Table 2.10. Moreover, after controlling for the institutional ownership Herfindahl-Hirschman index (Benton & You, 2019) and the percentage of independent directors on corporate boards (Goranova, Abouk, Nystrom, & Soofi, 2017), this study remains robust and shown in Table 2.11.

Table 2.9 Robustness test for winsored control variables

		ESP		WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	0.016				
	(0.07)				
F_CEO		0.057		0.221**	
		(0.63)		(2.17)	
F_Duality			0.275***		0.289***
			(4.36)		(3.07)
	(6.68)	(6.67)	(6.73)	(5.55)	(5.62)
Control variables winsored	YES	YES	YES	YES	YES
Constant	-0.443	-0.457	-0.435	-0.513	-0.450
	(-0.69)	(-0.71)	(-0.68)	(-0.98)	(-0.86)
Observations	1,364	1,364	1,364	1,364	1,364
R-squared	0.062	0.063	0.067	0.051	0.050
Number of N	332	332	332	332	332
Sargan-Hansen	YES	YES	YES	YES	YES
Chi-sq	0.000*	0.000***	0.000***	0.000***	0.000***
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the LPM with industry, year, and company fixed and standard errors clustered, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in

parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2.10 Robustness test excluding profitability variable

		ESP		WESP	
Variable	(1)	(2)	(3)	(4)	(5)
WOCB	0.036				
	(0.17)				
F_CEO		0.035		0.186**	
		(0.44)		(2.02)	
F_Duality			0.249***		0.276***
			(4.01)		(3.27)
Control Variables	YES	YES	YES	YES	YES
Constant	-0.757	-0.766	-0.763	-0.763	-0.715
	(-1.33)	(-1.35)	(-1.35)	(-1.59)	(-1.48)
Observations	1,576	1,576	1,576	1,576	1,576
R-squared	0.056	0.056	0.059	0.051	0.051
Number of N	380	380	380	380	380
Sargan-Hansen	YES	YES	YES	YES	YES
Chi-sq	0.000***	0.000***	0.000***	0.000***	0.000***
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the LPM with industry, year, and company fixed and standard errors clustered, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2.11 Robustness test for controlling Ind and IOHHI

		ESP		WESP	
Variables	(1)	(2)	(3)	(4)	(5)
WOCB	-0.015				
	(-0.07)				
F_CEO		0.065		0.211**	
		(0.75)		(2.09)	
F_Duality			0.260***		0.263***
			(4.01)		(2.80)
Ind	0.420*	0.441*	0.413*	0.012	-0.066
	(1.70)	(1.76)	(1.66)	(0.05)	(-0.28)
IOHHI	-0.128	-0.115	-0.089	-0.173	-0.177
	(-1.04)	(-0.93)	(-0.73)	(-1.39)	(-1.43)
Control variables	YES	YES	YES	YES	YES
Constant	-0.843	-0.880	-0.849	-0.582	-0.463
	(-1.38)	(-1.44)	(-1.39)	(-1.03)	(-0.82)
Observations	1,364	1,364	1,364	1,364	1,364
R-squared	0.069	0.069	0.073	0.056	0.054
Number of N	332	332	332	332	332
Sargan-Hansen	YES	YES	YES	YES	YES
Chi-sq	0.00***	0.00***	0.00***	0.00***	0.00***
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Cluster N	YES	YES	YES	YES	YES

This table presents the results of the LPM with industry, year, and company fixed and standard errors clustered, examining the relationship between women directors and the probability of receiving filed and withdrawn ESP. Ind is measured by the percentage of independent directors to total board members. IOHHI indicates the Institutional Ownership Herfindahl-Hirschman Index. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

2.6 Summary and conclusion

Using a sample of S&P 1500 companies, to our best knowledge, this paper provides the first empirical evidence on the influence of different roles of women directors on

corporate environmental shareholder activism in the U.S.. The estimation of a LPM with fixed effect regression indicates that at the shareholder proposal filing stage, women general directors and women CEOs have no impact on environmental shareholder activism, while CEO duality has a positively significant association. At the withdrawal stage, both CEOs and the CEO duality exhibit a strongly significant positive influence. The results are robust across a number of econometric models and alternative measures.

Despite the growing environmental consciousness in society, the increased focus of environmental shareholder activism on corporations, and the growing importance of gender diversity on corporate boards, there is a clear dearth of studies examining the extent to which women directors on corporate boards can influence the decisions of ESP. Consequently, the objective of this study is to examine the impact of different executive roles held by women directors on corporate boards and ESP at different stages based on gender socialisation theory and the managerial power perspective in order to provide a more complete explanation of the effect of corporate board diversity on environmental shareholder activism. In the following ways, this study extends and contributes to the existing body of knowledge.

This study first contributes to the existing literature by examining the effect of gender diversity on environmental shareholder activism. The majority of previous studies have focused on environmental performance and concluded that companies with women directors have an environmental preference to promote environmental performance (Boulouta, 2013; Kassinis et al., 2016; Liu, 2018; Setó-Pamies, 2015; Shoham et al., 2017), whereas other studies have found no or mixed associations between gender diversity and corporate environmental performance (Galbreath, 2011; Glass et al., 2016; Post et al., 2011; Prado-Lorenzo & Garcia-Sanchez, 2010). Among these, some studies investigate the influence of WOCB through the lens of feminine ethics theories with increased participation of WOCB (Boulouta, 2013; Kassinis et al., 2016; Liu, 2018; Shoham et al., 2017; Xiao & McCright, 2015). Therefore, the current literature on gender diversity provides limited and inconsistent evidence regarding the effects of women directors on promoting environmental strategies, and research on the impact of WOCB on shareholder activism is scant. Thus, this study contributes to the existing literature by examining the effect of different women directors' roles on environmental activist behaviour and provides more evidence to companies that, based on their gender traits, companies can benefit from having women directors when confronting environmental issues.

Second, this study contributes to the extant literature in the field of shareholder activism by advancing the understanding of feminine gender traits in environmental orientation and communal advantage. Some recent work has studied the influence of women directors with feminine theories. Building on role congruity theory, Gupta et al. (2018) have concluded that women CEOs on corporate boards are under greater threat from shareholder activism since their participatory attributes are not congruent with an aggressive leadership position. Jackson et al. (2021) argue that investors rely on gender stereotypes and cooperation when evaluating managers' responses to shareholder activism. This study suggests that feminine attributes are influential in reconciling environmental activists' deterrence.

Third, this study adds to the social-psychological significance of WOCB in shareholder activism. According to gender traits, women are more communicative, cooperative, and sensitive to others' problems (Eagly et al., 2003). The recent work from Francis et al. (2021) amplifies the fact that women CEOs are being targeted due to their strong communication and interpersonal skills when dealing with shareholder activists. However, limited research has yet looked into the relationship between vital women directors and withdrawn shareholder proposals, which indicates shareholders' success and shows a concession by management (Marquardt & Wiedman, 2016). The empirical evidence shows that as women

directors' power grows, they are more likely to consider the needs of a diverse range of stakeholders and are more likely to be associated with withdrawn environmental shareholder proposals. In other words, the role of women directors in promoting environment-related communication depends on the position they are in. This study argues that powerful women directors are more likely to exhibit feminine features on boards than less powerful directors.

Most importantly, this study illuminates potential difficulties faced by women pursuing leadership positions on corporate boards and potential opportunities for women to push environmental agendas, contributing to gender socialisation theory. This theory suggests that WOCB may be more likely than men to support environmental plans due to their heightened awareness of environmental issues and gender-specific experiences and sensitivity. It also highlights how gender norms and societal expectations affect environmental shareholder activists' attitudes and behaviours on WOCB and environmental sustainability concerns. If shareholders believe that women are well-suited for dealing with environmental issues, they may be more likely to support environmental proposals brought forward by women or collaborate with women directors on such issues. In conclusion, gender socialisation theory helps explain the complex relationship between WOCB and environmental shareholder activists. Studying the effects of gender norms and social expectations

on shareholders and women directors can reveal the factors that affect corporate governance, environmental sustainability, and gender equity in the workplace. By identifying and addressing these barriers and opportunities, organisations can work towards a more gender diverse board, a more inclusive culture, and improved environmental sustainability.

This study has significant implications for policymakers, the government, corporate management, and boards. This study suggests that firms facing environmental shareholder activism may be able to change their behaviour on environmental-related issues by promoting women directors to significant roles, as the current proportion of women directors and firms with women executives remains low. Policymakers and the government should consider methods to avoid symbolic management (Main & Gregory-Smith, 2018), for example, when formulating policy for gender quotas, they should consider not only the percentage or number of women directors but also their power and position.

This study also has several limitations and offers some important directions for future research. The investigation in this paper is based on U.S. firms from 2010 to 2018 due to data availability. Future research can be conducted on companies in other markets, particularly developing markets, to determine whether gender

diversity on corporate boards has comparable effects in different institutional environments and expand the period of time. Moreover, this study is covered by the ISS database of shareholder proposals and concentrates on executive power. Future research could include an investigation of diverse power assessments, such as education, demographics, and background, as well as a shareholder activism database with diverse criteria for obtaining environmental shareholder proposals, such as the Coalition for Environmentally Responsible Economies.

3. HOW SHAREHOLDER ACTIVISM BRINGS CHANGE TO CORPORATE ENVIRONMENT PERFORMANCE? -THE MEDIATING EFFECT OF GENDER DIVERSITY

3.1 Introduction

This Chapter aims to explore the mediating role of WOCB between WESP and subsequent CEP. On the basis of gender socialisation theory, it examines the effect of various executive roles held by women directors on corporate boards on the relationship between WESP and CEP.

Climate change has become one of the world's most significant problems, resulting in a variety of environmental threats. These include harsh weather, droughts, and

loss of biodiversity (WEF, 2022). The entire globe bears the repercussions of environmental destruction with all parties, including corporations, working to decrease environmental dangers. In addition to environmental standards, such as the ISO 14001, that controls firms' environmental behaviours, corporate governance has become an important mechanism for regulating environmental performance, fostering environmental management, and mitigating corporations' environmental degradation (Akram, Abrar-ul-Haq, & Raza, 2018; Daddi, Iraldo, Testa, & De Giacomo, 2019).

Shareholder activism has been one of the most active corporate governance mechanisms used for some decades, providing a means for engaged shareholders to influence and govern organisations if they are dissatisfied with a company's performance (Hirschman, 1970). To date, although the world experienced an unavoidable pause due to the COVID-19 epidemic, shareholder activism has never ceased (Summerfield, 2022) and remains prevalent in the U.S., accounting for 55% of all global activism in 2021 (Lazard, 2021). Since the SEC introduced Rule 14a-8 in 1934, permitting shareholders to submit proposals for inclusion on corporate ballots, shareholder proposals have been a favourite mode for shareholders to become actively involved in a broad range of issues faced by firms. Ever since, the proposals on environmental concerns have grown in significance over the years due

to the extensive impact of shareholders' participation in environmental issues (Rodrigue & Michelon, 2021). For example, environmental proposal submissions grew by 25% from 2020 to 2021 and by 46% between 2021 and 2022 (Georgeson, 2021, 2022), indicating that shareholder proposals are a significant method for shareholders to exercise their authority to change a company's environmental behaviour (Levit & Malenko, 2011).

Nevertheless, to date, submitted proposals under Rule 14a-8 have only been recommendations in the U.S., meaning that even when endorsed by a majority vote, they are non-legally binding and advisory (Levit & Malenko, 2011). As a result, shareholders' needs may not be addressed, and the effectiveness of these proposals has been questioned, because boards have undertaken fewer actions in response to shareholder proposals (Thomas & Cotter, 2007). Therefore, due to the non-legally binding rule, the subsequent implementation of a voting proposal by firms can be obscured. In this situation, it is uncertain how environmental shareholder proposals are likely to affect a company's subsequent environmental performance.

While the effects of voting proposals are not legally binding, the withdrawn proposals are a significant measure to improve CEP instead of voting on the company. Bauer

et al. (2015) reveal that a withdrawal decision effectively accomplishes shareholders' goals and is equivalent to a majority vote, apart from the outcome of the vote. Such a withdrawal indicates agreement because management has shown a desire to implement the proposal's recommendations (Landier & Nair, 2009). As suggested by Tkac (2006), environmental shareholder activists shifted their focus to withdrawn proposals with low voting support for their environmental proposals, reasoning that the withdrawal of a proposal can be interpreted as an indication that the company is willing to engage with shareholders and address their concerns. Noticeably, recently, Treviño et al. (2021) report that environmental proposals have been withdrawn at a substantially higher rate. In 2021, for instance, after management teams made significant concessions in response to concerns, more than half of all environmental proposals submitted were withdrawn. Tonello (2022) reports that, among the Russell 3000 companies, 187 proposals were withdrawn in 2022, up from 148 in 2020. In general, withdrawal numbers emphasise the importance of corporate-investor collaboration as a means of addressing shareholder concerns outside of the formal voting process that occurs during an AGM. For example, a resolution submitted by As You Sow, a non-profit shareholder advocacy group, against the company Dominion Energy was withdrawn when the firm stated its commitment to a net-zero carbon emission strategy designed to align its footprint with the milestones of the Paris Agreement (Tonello, 2022). Therefore, the motivation of this study is to investigate whether the withdrawn environmental

proposals would result in a change in the environmental behaviour of companies and how these withdrawn environmental proposals promote environmental performance.

Existing research on the effectiveness of withdrawn proposals on environmental performance is very limited. Some studies have sought to identify the relationship between shareholder proposals and CSR performance (Monks et al., 2004; O'Rourke, 2003; Sjöström, 2008), whereas the majority of the literature focuses on the total effect of shareholder proposals on combined CSR performance (David et al., 2007). Research on the impact of withdrawn proposals on CEP is scarce. As stated by Bauer et al. (2015), few studies investigate the influence of WESP on promoting changes in corporations, and the special category of withdrawn proposals has been largely neglected despite being a vital component of the proxy proposal process. Therefore, there has been little exploration and unpacking of the 'black box': Does ESP impact subsequent CEP? Accordingly, to the best of our knowledge, this is the first empirical study to investigate the influence of WESP on CEP, which remains understudied.

As environmental performance is a resource-intensive endeavour that may not generate profit for a company in the short term, management teams may be

reluctant to take action on such issues. The shareholder activists' environmental recommendations could be controversial and lead to tensions between shareholders and management. Therefore, in order to increase the impact of shareholder proposals, it is necessary to investigate the mechanisms for mitigating such tensions. Extensive research has demonstrated that promoting gender diversity in corporations can considerably enhance environmental performance (Glass et al., 2016; Kassinis et al., 2016; Liu, 2018; Setó-Pamies, 2015; Shoham et al., 2017; Zou et al., 2018). Accordingly, women directors may have a significant impact by aligning their objectives with those of shareholder activists who demand environmental sustainability. Therefore, it is opportune to investigate the effect of gender diversity in relation to both environmental shareholder activism and CEP.

Building on gender socialisation theory, this study considers the inclusive and interactive qualities that women directors can bring to a corporate board's environmental discussions. In this respect, this study aims to identify gender diversity mechanisms by empirically investigating the mediating role of women directorship in the WESP and CEP relationship, with the aim of revealing a potential mechanism of female directors leading a company to respond to environmental shareholder activists under the non-binding vote situation in the U.S.. This study uses a sample of S&P 1500 firms from 2010 to 2018 with a total of 2003 firm-year

observations using stepwise mediation models, the Sobel test, and the bootstrapping method to test the mediation effect. The empirical results indicate that there is no direct effect of WESP on CEP, although there is a significantly positive mediating influence of WOCB on the association between WESP and CEP. In addition, there is no significant mediation effect for CEOs or CEO duality. The evidence suggests that only the existence of gender-diverse corporate boards mediates the relationship between WESP and CEP, where women directors in crucial executive positions have little impact. Additionally, the effects are stronger for firms operating in environmentally sensitive industries. The findings imply that environmental shareholder activists are more likely to work with corporate boards that have a high level of gender diversity due to their inclusiveness and interpersonal interactions.

This study contributes to the literature in several ways. First, this study contributes to the existing corpus of literature on shareholder activism. Limited research has been conducted to date on shareholder proposals regarding corporate environmental performance (Flammer et al., 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009). For example, Reid and Toffel (2009) find that proposal filing and voting on environmental issues encourage corporations to adopt new environmental practices such as carbon disclosure. Lee and Lounsbury (2011) find a positive effect

of environmental shareholder resolutions on targeted firms' pollution management practices. However, due to the limited amount of data on withdrawn resolutions in previous years (Byrd & Cooperman, 2014) and the increasing number of ESP that have been substantially withdrawn in recent years, the scope of earlier empirical research is limited to voting proposals, and little attention is paid to the WESP and CEP. Therefore, this study investigates the impact of withdrawn proposals on environmental performance and, to the best of our knowledge, is the first to investigate the effect of WESP on CEP.

Second, this study contributes to the emerging literature on gender diversity. As asserted by Sjöström (2008), the effects of shareholder proposals on corporate behaviour may result from shareholders' influence, power, and requests, although the impact of corporate board members who make decisions about corporate behaviour is not included. Currently, the majority of prior research investigates the impact of gender diversity on board strategy (Huse, Nielsen, & Hagen, 2009; Nielsen & Huse, 2010b), corporate environmental (Bear et al., 2010; Boulouta, 2013), and stakeholder engagement (Kassinis et al., 2016; Post et al., 2011), while few studies investigate the impact of women's leadership on boards on shareholder activism and engagement with environmental-related activists. Hence, this study takes

existing literature further by showing the potential mediation role of gender diversity in the WESP and CEP relationship .

Third, this study expands gender socialisation theory research. To advance theoretical arguments, this study makes an empirical contribution by investigating the mediating role of female directors in the relationship between WESP and CEP, drawing upon gender socialisation theory. In doing so, this study provides a means of examining the collaboration skills of women directors in collaboration with shareholder activist groups regarding environmental issues in terms of withdrawal results. Lastly, this study reveals gender diversity as a potentially significant mediator when confronting environmental shareholder activists and promoting environmental strategies. It has important implications for companies, environmental shareholder activists, gender equality, policymakers, regulators, and practitioners. It can aid companies in achieving more sustainable outcomes and help satisfy the demands of environmental shareholder activists. It can also promote gender equality in the workplace, as the results show that the level of gender diversity is a significant mediator in promoting CEP. In addition to providing policymakers and regulators with information about propelling gender quotas on U.S. corporate boards, the findings also enlighten practitioners about the advancement of women board directors.

The remainder of the paper proceeds as follows: Section 3.2 reviews the theoretical framework. Section 3.3 discusses empirical literature review and hypotheses development. Section 3.4 describes the research design. Section 3.5 presents the empirical results and discussion, and Section 3.6 presents the summary and conclusions.

3.2 Theoretical framework

3.2.1 Gender socialisation theory

Gender socialisation theory posits that women and men establish different values and develop distinct social expectations from dominant societal culture through the socialisation processes of childhood (Chodorow, 1978; Gilligan, 1982; Stoller, 1964). Dawson (1992) traces the origins of gender socialisation theory to Piaget (1932) and Mead and Schubert (1934), who assert that behaviour is predicated by the process of socialisation during childhood, where individual behaviour is profoundly influenced from an early age so that the interpersonal dynamics of gender identity development differ between boys and girls (Block, 1973). Consequently, gender identity establishes different characteristics, values, and core personalities (Chodorow, 1978; Stoller, 1964), which leads to value orientation

differences (Glass & Cook, 2018). For example, Gilligan (1982) and Chodorow (1978) note the difference between the feminine emphasis on relationships and the masculine emphasis on justice. Eagly et al. (2003) assert that, compared to men, women have more communal characteristics such as affection, helpfulness, kindness, interpersonal sensitivity, and concern for others' wellbeing. In accordance with gender socialisation theory, women exhibit cooperative and relationship-building behaviours, whereas men exhibit individualistic and competitive attitudes (Chodorow, 1974; Gilligan, 1982). This study contends that these characteristics may result in distinct workplace behaviours.

There is currently a significant corpus of research investigating the impact of gender diversity of boards on promoting corporate environmental performance. Some of the research demonstrates a positive effect. For example, Post et al. (2015) use a sample of publicly-traded American oil and gas companies to study board composition and CEP. They conclude that the more the WOCB presentation, the higher the sustainability-themed alliances and CEP. Kassinis et al. (2016) argue that companies with a high proportion of female directors have a high level of concern for the environment. They conclude that environmental sustainability practices in business are directly and measurably impacted by gender diversity. Moreover, Li et al. (2017) provide empirical evidence in support of the positive effects of gender

diversity on a company's environmental policy. Similarly, Lu and Herremans (2019) identify a positive association between gender diversity on boards of directors and firms' environmental performance in the U.S. However, some studies contend that gender diversity does not, on average, improve a firm's performance (Adams & Ferreira, 2009). For example, Galbreath (2011) concludes that the proportion of female directors on a board is not significantly related to environmental quality. Bernardi and Threadgill (2011) consider whether, in Fortune 500 companies, gender exerts a tangible impact on organisational decisions. They conclude that having female board members may strongly correlate with social responsibility, but not to the same extent as environmental responsibility. In addition, Hayes and Bernadette (2001) contend that, although males and females differ in terms of their scientific knowledge, this has little or no impact on their environmental attitudes.

To sum up, the present study on the effect of WOCB on CEP shows inconclusive results. As a result, it is inferred that the lack of a definitive association between WOCB and CEP is because women directors may increase CEP through other indirect processes. Notably, gender diversity studies reveal that female directors exhibit communicative traits and contribute to the maintenance of relationships when dealing with demanding stakeholders. Previous empirical studies have grounded in gender socialisation theory to identify that companies with WOCB are

more likely to be committed to environmental sustainability and responsibility, and reduced environmental misconduct (Liu, 2018; Post et al., 2015; Shoham et al., 2017). For example, women directors possessed with gender traits are highly responsive to shareholders' concerns and strongly inclined to engage in communication on environmental matters (Post et al., 2015) because female leaders are more likely to have participative and communal leadership styles (Cole, 2004; Eagly et al., 2003; Eagly & Johnson, 1990). In addition, women directors with such socialised traits are more stakeholder-focused and long-term oriented, integrating the interests of diverse stakeholders and promoting relationship building with a longer-term vision, which coincides with the promotion of environmental efforts (Brammer, Millington, & Pavelin, 2007; Glass et al., 2016; Matsa & Miller, 2013). Therefore, this study contends that WOCB may contribute to the reconciliation of the relationship between a company and its stakeholders due to their communal characteristics established through the socialisation process.

Due to the frequent requirement for a substantial amount of resources with little short-term return, management is reluctant to rapidly execute environmental initiatives and regards them as detrimental to companies' interests (De Villiers, Naiker, & Van Staden, 2011). To assure and satisfy the long-term interests and the shareholder's requests, it is crucial for shareholders and the company to have in-

depth conversations and a collaborative relationship. This demand has been manifested with surging shareholder proposals on environmental issues, particularly climate-related proposals, for a second consecutive year, surpassing the number of proposals submitted in 2018 following the U.S. exit from the Paris Agreement in 2017 (Treviño et al., 2021). It indicates that environmental shareholder activists are in high demand to make changes to the company's environmental performance.

In the meantime, Treviño et al. (2021) report that environmental proposals were withdrawn at a significantly higher rate in 2021 than in 2020, with 70 being withdrawn of a total of 115 in 2021, compared to 39 in 2020. They state that major shareholder activists rarely reached agreements with firms unless the companies committed to achieving specified environmental goals or at least agreed to their demands. Companies have chosen to engage with shareholder activists, instead of putting a proposal to a vote in light of institutional investors' increasing focus on environmental issues (Treviño et al., 2021). This report demonstrates that shareholders are beginning to communicate with corporations in the hope that they will undertake action on concerns of this nature. As a result, this study hypothesises that the role of WOCB, which may be a critical contributing mediator due to its communal qualities developed through the socialisation process, is aligned with

shareholder activists who have environmental expectations and desire companies to improve their environmental performance.

3.3 Empirical literature review and hypotheses development

3.3.1 ESP and CEP

The significance of shareholder proposals on environmental issues has grown over time. Environmental shareholder activists adopt proactive strategies to enact changes in environmental practices and policies in order to exert influence on firms regarding environmental protection (Rodrigue & Michelon, 2021). Shareholder proposals are one of their common tools (Levit & Malenko, 2011). According to Rule 14a-8 in the U.S., any shareholder who has continuously held shares worth USD$2,000, or 1% of the market value of stock, for at least one year is permitted to make a maximum of one proposal, together with a 500-word supporting statement, to the proxy that is sent to the firm prior to its annual shareholder meeting. These proposals must be submitted at least 120 days before the proxy is issued to shareholders in order to elicit a vote from them on a specific topic (Ertimur, Ferri, & Stubben, 2010).

There are typically three potential outcomes for shareholder-initiated proposals. Firstly, management can allow the proposals to be submitted via the proxy statement and voted on by shareholders at the company's AGM. Secondly, if management does not wish to put a proposal to a vote but would like to find a compromise and undertake actions on the concerns raised, sponsoring shareholders can withdraw proposals prior to the meeting. If no agreement is achieved, the sponsoring shareholder does not withdraw the proposal, and it remains on the AGM's voting agenda. Thirdly, the management can contact the SEC to confirm that all regulatory requirements for proposal exclusion have been met, and the SEC can omit proposals that do not comply with regulatory rules (Rojas et al., 2009).

Although existing research demonstrates some shareholder proposals' achievements in corporate environmental change (Tkac, 2006), empirical studies to date are limited (Flammer et al., 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009). For example, it has been proven only empirically that proposal filing and voting on environmental issues encourage corporations to adopt new environmental practices such as carbon disclosure (Reid & Toffel, 2009), corporate pollution management practices (Lee & Lounsbury, 2011) and Carbon Disclosure Project (CDP) reporting (Flammer et al., 2021). Despite a number of positive corporate responses and

actions identified in response to shareholder votes, SEC Rule 14a-8 indicates that, in the U.S., proposals which would be binding on a firm are considered improper, indicating the reluctance of states to limit a board's authority to exercise business judgement and its fiduciary responsibilities. Consequently, the vast majority of shareholder proposals are written as recommendations to the board and are non-binding and precatory, even if adopted at the AGM (Ertimur et al., 2010).

This implies that the subsequent impact of these proposals is uncertain in terms of the fact that shareholder proposals are merely advisory. Even if a proposal obtains a significant majority of votes cast at a proxy meeting, a company's board has the right to decide whether the adoption of any or all of a shareholder's proposal is in the best interests of the company (Levit & Malenko, 2011). Similarly, O'Rourke (2003) asserts that shareholder proposals only cause companies to make voluntary changes after the achievement of their financial goals. Despite the fact that shareholder proposals are one of the most direct means for shareholders to convey their concerns to firms, given their non-binding nature, researchers contend that voting proposals are not necessarily conducive to changes in corporate policy (Rojas et al., 2009). It is believed that improvement after a voting proposal remains modest and is neither revolutionary nor long-term, which leads to the shift of

shareholders' focus to WESP. As argued by Bauer et al. (2015), a withdrawal decision effectively accomplishes shareholders' goals.

3.3.2 WESP and CEP

Tkac (2006) asserts that a proposal is successful when a company executes the shareholder-requested action, hence, to achieve the goal of implementation, improved communication with boards is crucial. However, due to the limited effect of voting proposals, it is difficult for shareholders to impact companies' strategies and business operations. For example, when suggestions are directed at a public company which requires fundamental changes to its strategy, policy, and operations, the organisation may perceive shareholder proposals as a threat, because management may regard them as detrimental to the organisation (Bauer et al., 2015). In this case, companies may deploy defensive mechanisms such as 'poison pills' and 'staggered boards' to defend against such initiatives. Consequently, shareholder activists must convince and communicate with a board of directors, or the majority of shareholders, for their proposals to be approved in the company's best interests (Levit, 2019). In this respect, building up a communication channel is necessary.

Though investors are unable to impose their ideas on target companies due to the ineffectiveness of Rule 14a-8 and the limited holding of controlling shares, Uson (2015) argues that shareholder proposals continue to be an effective tool for minority shareholders because they can still influence managerial decisions by bringing issues to the forefront, even if their proposals fail. Notably, empirical research regards withdrawn resolutions as a good governance instrument which extends beyond the outcome of the vote on their specific request in order to promote corporate reform (Bauer et al., 2015; Graves et al., 2001; Tkac, 2006) as an effective communication channel. Existing research shows that the withdrawal of a proposal can be interpreted as a sign of success (Tkac, 2006). If managers believe that certain ideas may be detrimental to their interests or reputation, they may prevent shareholder proposals from being put to a vote (Renneboog & Szilagyi, 2011). In response to a shareholder-initiated proposal, companies therefore reach out to activist shareholders prior to the AGM for private negotiations. Bauer et al. (2015) explain that, if negotiations between the sponsoring shareholder and management are successful, the shareholder is likely to withdraw the proposal voluntarily, and the firm is likely to undertake action on the issues raised.

Graves et al. (2001) concur that the greatest significant accomplishment of shareholder advocates is the withdrawal of proposals. They suggest that withdrawal

demonstrates a corporation's willingness to discuss an issue, despite the fact that it may not be willing to concede. In a similar vein, Tkac (2006) observes that a withdrawn proposal often signifies a corporate action such as communication, agreement to an idea, or an alternative form of compromise. In this respect, the effectiveness of shareholder activism is not limited to a majority vote, even if a proposal is not voted on at an AGM and is ultimately withdrawn, shareholder activism draws attention to a company's problematic environmental practices, enhancing its sway with management (Rodrigue & Michelon, 2021).

In the past, researchers have examined specific subsamples of shareholder proposals which received votes in order to draw conclusions about their potential to drive corporate improvements (Buchanan, Netter, Poulsen, & Yang, 2012; Ertimur et al., 2010), although they pay little attention to the effect that withdrawn proposals have on corporate environmental performance. Some studies note and analyse the fact that withdrawn proposals lead to an increase in future company actions on resolution issues (Bauer et al., 2021; Graves et al., 2001; Sjöström, 2008; Tkac, 2006). Other research, however, questions whether the withdrawal represents a real success in changing business policy (Rojas et al., 2009). Due to the limited amount of data on negotiations and withdrawn resolutions, which has limited the scope of earlier empirical research to proposals which are voted on, this hypothesis has not

been empirically examined (Byrd & Cooperman, 2014). As previously discussed, proposals are non-binding, although there is evidence that withdrawn proposals exert a positive effect on environmental performance, and their influence remains under investigation. This perspective leads to the hypothesis that:

H3.1: Withdrawn environmental shareholder proposals exert a positively significant impact on corporate environmental performance.

3.3.3 The mediating role of WOCB

Building on gender socialisation theory, women directors exhibit interactiveness and inclusiveness, which can be advantageous when dealing with environmental shareholder activists requirements. According to arguments developed from research into gender roles and gender differences, women are more willing to listen and communicate, which is advantageous for both group dynamics and effectiveness (Curşeu, Chappin, & Jansen, 2018). In collaborative learning contexts, men tend to have confrontational and assertive communication styles, whereas women demonstrate concern for others and a communal communication style (Carr, 2004). As a result of their superior communal-expressive qualities, women tend to have a greater relational orientation (Abele, 2003) and are therefore more likely to

receive more attention than men because of their ability to establish and maintain harmonious interpersonal interactions during group discussions (Konrad, Kramer, & Erkut, 2008). As environmental shareholder activists have a high demand for communication with management during the withdrawal process, it is believed that the presence of women on corporate boards is crucial to their success.

Moreover, according to the gender socialisation theory, female directors acquire inclusive qualities through the socialisation process. In addition to promoting inclusivity among a variety of stakeholders, the presence of women on boards also facilitates the discussion of a wide range of topics. On the one hand, research shows that women tend to focus on relationship building and collaboration (Carr, 2004). The proportion of women in groups is favourably associated with a positive affective climate, which ultimately promotes the quality of interpersonal relationships in groups (Curşeu et al., 2018). Nielsen and Huse (2010a) note that gender-diverse boards report fewer disputes because female directors consider the concerns of others, which results in active involvement in strategic issues affecting the organisation and its stakeholders. It implies that organisations with a high proportion of women on their boards are associated with strong strategic control and act more cooperatively, exhibiting fewer disagreements than similar ones (Nielsen & Huse, 2010a). Particularly in the workplace, women in organisations tend to encourage

involvement and the sharing of information when participation enhances support for ultimate decisions, decreasing the likelihood that ideas are undermined by unforeseen opposition (Rosener, 2011). Consequently, empirical evidence demonstrates that women directors have a higher attendance rate at board meetings than their male counterparts (Adams & Ferreira, 2009), suggesting that they are more willing to discuss board and corporate issues and are more capable and committed to the construction and maintenance of interpersonal relationships (Konrad et al., 2008).

On the other hand, women directors raise a variety of topics that are less frequently discussed in male-dominated boardrooms. Interviews conducted by Konrad et al. (2008) with the female directors of Fortune 1000 companies indicate that they are more likely to extend the scope of boardroom conversations to include the viewpoints of various stakeholders. Although research suggests that women encourage inclusiveness, there are costs to being inclusive, such as the fact that requesting ideas and information from others takes time, frequently involves giving up power, provokes criticism, and exposes both personal and turf conflicts (Rosener, 2011). It is considered that raising a wide range of concerns supports a board in moving beyond short-term financial metrics and focusing on variables, which is likely to sustain sound long-term performance (Konrad et al., 2008).

Therefore, it appears that WOCB is important for shareholder activists in environmental demand to achieve a more sustainable outcome and for companies to build a positive relationship with stakeholders, as WOCB contributes to a high level of concern for the needs of diverse stakeholders and issues, as well as stakeholder relationship building.

Despite the fact that previous research has employed gender socialisation theory to examine the effect of WOCB on environmental performance (Liu, 2018; Post et al., 2015; Shoham et al., 2017), no research has examined the significance of WOCB in engaging with environmental shareholder activists in the withdrawal process and thus contributing to environmental behaviours. In the field of shareholder activism and CEP, research has primarily focused on filing proposals as opposed to WESP (Flammer et al., 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009). Bauer et al. (2015) examine the effectiveness of WESP, but they focus on sponsor identity and pay practices rather than environmental performance. Therefore, this study attempts to fill the gap in existing literature, investigates the mediating effect of gender diversity between WESP and CEP based on gender socialisation theory, and provides empirical evidence of female directors' attitudes towards environmental issues. This study argues that female directors on boards may act as mediators, bringing their gender traits of interactiveness, inclusiveness,

communality, cooperation, and concern for others to boards when addressing strategic matters such as environmental issues. When female directors are on corporate boards, such socialised traits have a significant impact on maintaining relationships with shareholder activists and stakeholders, as well as a comprehensive range of discussion topics, which may reduce the deterrence of activism and encourage subsequent actions. Therefore, it is hypothesised that,

H3.2: Women on corporate boards mediates the positive association between environmental shareholder activism and corporate environmental performance.

3.4 Research design

3.4.1 Sample construction

The initial dataset consists of shareholder resolutions filed by S&P 1500 companies in the U.S. This study's data spans the years 2010 to 2018 with 2003 firm-year observations in order to reduce the disparity produced by the 2020 'Women on Boards Campaign' initiated in the U.S. in 2010. Withdrawn results are derived from the Shareholder Proposal S&P 1500 database of ISS, while environmental performance scores are sourced from the Asset 4 database. Environmental resolutions with withdrawn results are specifically chosen on the basis of natural

environment-related topics and themes (detailed in Appendix A) from the ISS database. Due to the availability of data (detailed in Appendix G), the final sample includes 494 firms. The sample firms may have had one or more environmental proposals over a number of years and might not necessarily have one every year.

3.4.2 Model specification

The most frequently and traditionally used model for mediation analysis is the stepwise model, also known as the stepwise model, proposed by Baron and Kenny (1986). This model has been widely used for the testing of mediators (Bear et al., 2010; Fernando, Jain, & Tripathy, 2020; Garcia Martinez, Zouaghi, & Sanchez Garcia, 2019; Hasan, Kobeissi, Liu, & Wang, 2018; Rodríguez & Nieto, 2016; Sánchez-Medina, Díaz-Pichardo, Bautista-Cruz, & Toledo-López, 2015; Torchia et al., 2011; Wu, Kwan, Yim, Chiu, & He, 2015; Xia & Liu, 2018).

While Barona and Kenny's method (Baron & Kenny, 1986) clearly describes the conceptual ties between each postulated causal relationship and the statistical assessments of these relationships, the validity of this method is increasingly being questioned (Alt, Díez-de-Castro, & Lloréns-Montes, 2015). MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) contend that the overall purpose of the stepwise

approach is to build circumstances for mediation, not to conduct a statistical test of the indirect influence of, for example, X on Y via M. Hence, this method demands a direct effect of independent variables on dependent variables. In this respect, Baron and Kenny (1986) define mediation as being established firstly by a causal effect on the outcome that can be mediated, followed by a determination of whether the mediator accounts for this effect.

However, Collins, Graham, and Flaherty (1998) contend that mediation is a chain reaction in which an independent variable firstly influences a mediator, after which the mediator influences a result. Therefore, the stepwise approach is problematic because there is no necessity for a sufficient direct effect to establish an overall effect in order for mediation to occur. Further, Preacher and Kelley (2011) argue that Baron and Kenny's mediation model (Baron & Kenny, 1986) has disadvantages with the fulfilment of the complete mediation model in the default use of the partial mediation descriptor. The stepwise approach also fails to provide standard errors for building confidence limits (Baron & Kenny, 1986); more importantly, this method has Type I error rates which are too low in all simulation situations and very low statistical power for the effects of small to medium sizes (MacKinnon et al., 2002).

The Sobel test is an alternative ‘product-of-coefficients’ approach to Baron and Kenny's model (Alt et al., 2015). This method is based on the asymptotic standard error of the indirect impact, utilising the multivariate delta method (Sobel, 1982, 1986). Research suggests that the estimator of standard error in the Sobel test has a low degree of bias for sample sizes of at least 50 in single-mediator models (MacKinnon et al., 2002; MacKinnon, Warsi, & Dwyer, 1995).

Contrary to the limitations of the stepwise approach for constructing the confidence interval, a p-value or confidence interval can be created by use of standard normal distribution in the Sobel test (Hayes & Rockwood, 2017). This study uses the Sobel test as its primary method of examining mediation effects because the study’s sample size is greater than 50, enabling the lower statistical power issue from Baron and Kenny's model to be sidestepped. Nevertheless, the multivariate delta approach is a universal method for determining the variance of functions of random variables which adhere to a multivariate normal distribution (Bishop, Fienberg, & Paul, 1975).

Therefore, the sampling distribution of the ratio to its standard error is normal. Due to the fact that the sampling distribution is typically not normal, research demonstrates that the Sobel test has less power (Hayes & Scharkow, 2013). Despite selecting an inappropriate reference distribution for the sampling

distribution of a statistic resulting in decision errors and inadequate confidence intervals, this study employs the bootstrapping test of mediation as a precaution, because the Sobel test may produce erroneous results based on the assumption of normality (Preacher & Hayes, 2004).

The bootstrapping method has been favoured over the Sobel test and the stepwise method because it is more effective at preventing Type I errors (MacKinnon et al., 2002; Preacher & Hayes, 2008). Bootstrapping is a non-parametric resampling technique that includes repeatedly drawing samples from a dataset and estimating the indirect effect of each resampled data set (Hayes, 2009; MacKinnon, 2012; Preacher & Hayes, 2008; Tibshirani & Efron, 1993).

By repeating this procedure, an empirical estimate of the sampling distribution is created, which is then used to establish confidence intervals (CIs) for the indirect impact. This requires extracting 1000 bootstrap samples from the dataset to estimate 95% confidence intervals for coefficients of indirect effects (Hayes & Scharkow, 2013; Preacher, Rucker, & Hayes, 2007). Research demonstrates that bootstrapping is the most effective and appropriate strategy for determining confidence intervals for specific effects under the majority of scenarios (Hayes, 2009; Hayes, Slater, & Snyder, 2008; Lockwood & MacKinnon, 1998; MacKinnon,

Lockwood, & Williams, 2004; Preacher & Hayes, 2008; Shrout & Bolger, 2002). Therefore, in this study, the bootstrap method is used to assess the indirect effects of WOCB on withdrawn proposals on environmental performance.

To address the possibility of reverse causality and the endogeneity issue, this study aligns the multi-level model with the stepwise approach in industry and time fixed effects to control for company heterogeneity and other unobservable company characteristics (Adams & Ferreira, 2009; Hasan et al., 2018; Orazalin, 2020). The multi-level fixed effects model is used to exclude groups with a single observation because retaining singleton groups is computationally inefficient and overstates the statistical significance of the regression coefficients, leading to incorrect inference (Correia, 2015, 2016). This model absorbs the year-industry fixed effect with standard errors clustered by firms. The industry is defined on the basis of the two-digit North American Industry Classification System (NAICS) code. The study also uses two-year-lagged independent variables and two-year-lagged control variables (Liu, 2018) to mitigate the problem of reverse causality and the time for proposals to influence firm performance. Based on the empirical estimations of this study, En_score is the dependent variable, while women directors on corporate boards is a mediating variable (WOCB). The multiple regression with FE is estimated that:

$$Y_{i,t} = \beta_0 + \beta_1 sWESP_{i,t-2} + \beta_2 WOCB_{i,t} + \beta_3 Size_{i,t-2} + \beta_4 Profitability_{i,t-2} + \beta_5 Leverage_{i,t-2} + \beta_6 Sponsor_{i,t-2} + \beta_7 Board\_Size_{i,t-2} + \beta_8 IOHHI_{i,t-2} + \beta_9 TDC1_{i,t-2} + a_i + \sum_t^i industry + \sum_t^i year + \varepsilon_{i,t}$$

Where the subscript, *i,* refers to the firm number and the subscript, *t,* denotes the time period, the dependent variable ($y_{i,t}$) is corporate environmental performance scores for the firm *i* in time *t*; β_0 is a constant. $\beta_1 - \beta_9$ are the parameters for the explanatory variables; a_i stands for unobserved time-invariant firm effects, and s*WESP* is the total number of withdrawn environmental shareholder proposals. *WOCB* refers to the percentage of women directors on boards, female CEOs or female CEO-Chair duality. *Size* refers to firm size, *Profitability* refers to firms' profitability ratio; *Leverage* represents firms' leverage ratio, *Sponsors* is institutional sponsors who submitted environmental proposals, *Board_Size* denotes board size, *IOHHI* denotes the Institutional Ownership Herfindahl-Hirschman Index, *TDC1* is directors' total compensation, *Industry* is industries sorted by two-digit NAICS code, *Year* is the time trend, and ($\varepsilon_{i,t}$) is the error term.

3.4.3 Dependent variables

Corporate environmental performance

The environmental performance of companies is measured by using the environmental scores from the Asset 4 ESG Score database. The environmental pillar accounts for emissions, innovation, and resource consumption (Refinitiv, 2020). In contrast to Morgan Stanley Capital International (MSCI)'s environmental ratings, the aim of which is to gauge a company's resistance to financially-material environmental risks (MSCI, 2022), Asset 4 scores offer an overall evaluation of the quality of a company's business operations, recognising those firms which look beyond the next quarter and prioritise the delivery of long-term shareholder value (Ribando & Bonne, 2010). This has been validated as “the largest, most robust, objective, and fully-transparent quantitative model of ESG information” (Ribando & Bonne, 2010, p. 8).

3.4.4 Independent variables

Withdrawn proposals

This study measures withdrawn corporate environmental shareholder resolution as ‘sWESP’, being a continuous variable representing the total number of environmental shareholder proposals in a 'withdrawn' state for a given firm in a given year. The binary variable of WESP, where 1 indicates having a environmental shareholder proposal in a 'withdrawn' state for a given firm in a given year and 0 otherwise, is further examined as a robustness check (Bauer et al., 2015). As WESP

can indicate successful engagement between shareholders and companies (Tkac, 2006), studying WESP can shed light on the extent to which a company's actions are in line with shareholder expectations. By examining the relationship between withdrawn proposals and environmental performance, it is possible to determine whether shareholder activism has an impact on corporate sustainability practices.

3.4.5 Mediating variables

Gender diversity

This study conducts a comprehensive analysis of the roles of gender diversity among corporate board members as mediators. In the primary model, the proportion of women on corporate boards (WOCB) is analysed (Al-Shaer et al., 2022; Ben-Amar, Chang, & McIlkenny, 2017; Terjesen & Singh, 2008). As management authority influences cognition and decision-making across a variety of corporate strategies and sustainable outcomes (Finkelstein, 1992; Kipnis, 1972). In additional analysis, the role of women in predominant positions as the binary variables of women executive directors (F_CEO) (Liu, 2018; Palvia, Vähämaa, & Vähämaa, 2015) and female CEO-Chair duality directors (F_Duality) (Beji, Yousfi, Loukil, & Omri, 2021; Jo & Harjoto, 2011; Pucheta-Martínez, Bel-Oms, & Olcina-Sempere, 2018) are examined. The number of female directors on boards is further verified as a robustness check (Elmagrhi, Ntim, Elamer, & Zhang, 2019).

3.4.6 Control variables

To assess firm size, the natural logarithm of the market value of equity is used (Si & Xia, 2022). Larger companies are more likely to pay attention to environmental issues due to their prominence (Rehbein et al., 2004) and have more resources invested in innovative activities (Juo & Wang, 2022). So firm size is expected to be positively related to CEP.

Leverage is the ratio of debt in current liabilities and long-term debt to total assets (Flammer, 2015; Francis et al., 2021). Companies with better environmental performance usually have higher levels of debt (Clarkson, Li, Richardson, & Vasvari, 2008). So the leverage is expected to be positively related to CEP.

McKendall, Sánchez, and Sicilian (1999) find that profitable firms are more likely to be able to afford high environmental compliance expenses and may demonstrate stronger environmental performance. Hence, this study controls for the ratio of earnings before interest and taxes (EBIT) to total assets in order to determine the profitability of a business (Gupta et al., 2018). The profitability ratio is expected to be positively related to CEP.

Board size refers to the number of board members. This is controlled because large boards are more likely to have specialists in environmental performance issues (De Villiers et al., 2011). However, research finds that board size negatively affects firm innovation (Zona et al., 2013). So the relationship between board size and CEP is uncertain.

This study controls for the Institutional Ownership Herfindahl-Hirschman Index (IOHHI) as a measure of the concentration of institutional ownership, among all institutional investors in a specific firm or industry. The environmental performance of a company may be linked to the concentration of institutional ownership which is calculated as the percentage of a company's shares held by institutional investors (DesJardine, Shi, & Sun, 2022). This study controls for the level of institutional ownership because the ownership structure of firms may serve as a determinant of their environmental proactivity (Calza, Profumo, & Tutore, 2016). So the IOHHI is expected to be positively related to CEP.

Total executive compensation is calculated using TDC1 from the Execucomp database. It is the logarithm of the sum of salary, bonus, the total value of restricted stocks and stock options granted during the fiscal year, long-term incentive payouts,

and all other compensation (Harris et al., 2019). This study controls for total remuneration because a director's view and response to corporate environmental issues may be influenced by compensation sensitivity (Levit & Malenko, 2011), which may exert an impact on company performance. So the total compensation is expected to be positively related to CEP.

This study uses a binary variable to measure sponsor type if institutional investors (excluding individual investors) propose an environmental shareholder proposal to the company to measure the influence of institutional investors' actions in activism (Flammer et al., 2021)[3]. Large institutional investors may play a pivotal role in reorienting management practices towards environmentally desirable courses of action, which may provoke the defiance of management to deal with their requests. So this study predicts a negative relationship between institutional sponsors and CEP.

[3] Proposals filed by individual shareholders to impact environmental performance are, on average, less likely to be withdrawn than those filed by institutional investors, labour union pension funds, and coordinated activist proposals (Bauer et al., 2015).

3.5 Empirical results and discussion

3.5.1 Descriptive statistics and correlations

The descriptive data for dependent, independent, and control variables is shown in Table 3.1. The results show that the average environmental performance score for the sample companies is 46.32, and the standard deviation is 28.32. The independent variable sWESP is a continuous variable indicating the total number of ESP withdrawn in the given year. The mean value of sWESP is 0.172, meaning approximately 2 WESP are filed each year, with a standard deviation of 0.438. The average percentage of female directors on boards is 19.1%, and some companies have no female directors on their corporate boards. This shows a low representation of women holding board positions in the U.S. between 2010 and 2018. Though the maximum percentage is larger than half, there are still some boards without women directors as 0 in minimum. In addition, Table 3.1 shows that, on average, the board has around 11 members (10.680). The institutional ownership has a consentrated proportion of 11.5% of the total ownership. About 60.3% of the WESP is sponsored by institutional investors.

Table 3.2 presents the Pearson correlation matrix. The correlation coefficients between corporate environmental performance, withdrawn proposals, and female directors on boards are positive and statistically significant, providing support for

Hypothesis 3.1 and Hypothesis 3.2. Overall, the low degree of correlation observed between variables gives little cause for multicollinearity diagnoses. The variance inflation factor (VIF) is also examined for probable multicollinearity. The highest VIF value in the models is 2.14, while the average VIF value is 1.39 (detailed in Appendix H), both of which are significantly below the threshold points. VIF above 10 is regarded as indicating multicollinearity (Neter, Kutner, Nachtsheim, & Wasserman, 1996). All variables descriptions are shown in Appendix I.

Table 3.1 Sample descriptive statistics

VARIABLES	N	mean	sd	min	max
En_score	2,003	46.320	28.320	0	98.510
sWESP	2,003	0.172	0.438	0	4
WOCB	2,003	0.191	0.100	0	0.750
numWOCB	2,003	2.058	1.130	0	7
F_CEO	2,003	0.052	0.223	0	1
F_Duality	2,003	0.028	0.163	0	1
Profitability	2,003	0.105	0.083	-1.375	0.444
Leverage	2,003	0.278	0.150	0	0.942
Size	2,003	8.658	1.332	3.140	12.160
Board_Size	2,003	10.680	2.095	4	34
TDC1	2,003	8.390	0.659	5.700	11.160
Sponsor	2,003	0.603	0.489	0	1
IOHHI	2,033	0.115	0.145	0.014	1

This table presents descriptive statistics for variables. The data is panel data for an unbalanced sample of 2003 firm-year observations for 2010–2018. Not all firms have data for all years. All variables are defined in Appendix I.

Table 3.2 Pairwise correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) En_score	1.000												
(2) sWESP	0.070***	1.000											
(3) WOCB	0.284***	0.023	1.000										
(4) numWOCB	0.391***	0.030	0.929***	1.000									
(4) F_CEO	0.104***	0.020	0.271***	0.253***	1.000								
(5) F_Duality	0.098***	0.053**	0.188***	0.186***	0.714***	1.000							
(6) Profitability	0.030	-0.029	-0.028	-0.045**	-0.014	-0.022	1.000						
(7) Leverage	0.108***	-0.005	0.088***	0.148***	0.005	0.037*	-0.194***	1.000					
(8) Size	0.499***	0.119***	0.155***	0.276***	0.054**	0.076***	-0.108***	-0.044*	1.000				
(9) Board_Size	0.379***	0.006	0.104***	0.407***	0.041*	0.055**	-0.075***	0.175***	0.403***	1.000			
(10) TDC1	0.399***	0.006	0.139***	0.213***	0.089***	0.076***	0.062***	-0.010	0.572***	0.253***	1.000		
(11) Sponsor	0.065***	0.195***	-0.010	0.003	0.026	0.043*	-0.064***	0.007	0.150***	0.016	0.083***	1.000	
(13) IOHHI	0.007	-0.028	0.019	0.024	-0.059***	-0.047**	-0.114***	0.129***	-0.030	0.017	-0.049**	-0.022	1.000

*** p<0.01, ** p<0.05, * p<0.1

3.5.2 Mediation analysis and main results

To test the hypothesis, the traditional stepwise approach is firstly applied, using multi-level regression analysis with fixed effects in panel data analysis (Jell-Ojobor & Raha, 2022; Orazalin, 2020) evaluated by the Durbin-Wu-Hausman specification test (Hausman, 1978) and robust standard errors in all panel data models (Carter et al., 2010).

The results of Baron and Kenny's model (Baron & Kenny, 1986) are presented in Table 3.3. As shown by the models of the stepwise approach, the study does not find a direct relationship between WESP and CEP in Model 1, which does not supports H3.1 that WESP exert a positively significant impact on corporate environmental performance. As previously explained, Baron and Kenney's method is inapplicable in this situation because it is not appropriate to analyse the mediating role if the connection is not constructed in the first step. However, the absence of a correlation between X and Y does not preclude female directors from exerting an indirect effect on corporate environmental performance via withdrawn environmental proposals (X-M-Y) (Hayes, 2009). Shrout and Bolger (2002) contend that the significance of the link between X and Y is not an absolute prerequisite for establishing the presence of an indirect effect. Therefore, despite the expectation that WESP would have a positive, statistically significant effect on the subsequent CEP, this empirical finding indicates that there is no significant correlation between WESP and CEP. It suggests that under SEC Rule 14a-8, advisory proposals have no significant effect on management's movement directly, even if a withdrawal

process occurs and a certain degree of shareholder and management agreement is reached.

However, Model 2 and Model 3 suggest that it is still possible to check the positive and significant relationship between WESP and CEP, as Model 2 shows a positively significant ($p < 0.5$) impact of withdrawn environmental proposals on WOCB (X-M). Model 3 provides evidence of the positive and statistically significant ($p < 0.01$) impact of WOCB on CEP (M–Y). It shows a strong correlation between X-M and M-Y, though X-Y has been found to be uncorrelated, which could be a limitation of the stepwise models (Preacher & Kelley, 2011). To further investigate whether WOCB plays a mediating role in the relationship between WESP and CEP, this study examines the indirect path (X-M-Y) using Sobel's formal significance tests and bootstrap testing with confidence intervals (Garcia Martinez et al., 2019) shown in Table 3.4.

Table 3.3 WESP and CEP: the mediating role of WOCB

	Model 1 CEP	Model 2 WOCB	Model 3 CEP
sWESP	1.960	0.011**	1.477
	(1.44)	(2.33)	(1.11)
WOCB			43.396***
			(3.60)
Profitability	28.601	-0.095*	32.708*
	(1.59)	(-1.83)	(1.80)
Leverage	12.042	0.009	11.644
	(1.11)	(0.26)	(1.10)
Size	8.340***	0.010*	7.887***
	(5.95)	(1.91)	(5.70)
Board_Size	2.963***	0.003	2.851***
	(4.50)	(1.25)	(4.41)
TDC1	4.221*	0.006	3.974*
	(1.74)	(0.66)	(1.71)
Sponsor	-0.194	-0.005	0.020
	(-0.11)	(-0.71)	(0.01)
IOHHI	0.185	0.022	-0.788
	(0.03)	(0.71)	(-0.11)
Observations	1,058	1,058	1,058
R-squared	0.404	0.256	0.421
Sargan-Hansen	Y	Y	Y
Chi-sq	0.000***	0.000***	0.000***
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

This table presents the results of the multi-level model with industry, year fixed, and standard errors clustered, examining the mediation effect of WOCB between WESP and CEP. Standard errors are in parenthesis. ***, **, and * denote the level of statistical significance at the 1%, 5%, and 10% levels, respectively.

The findings of the Sobel test and the Bootstrap test examining the mediating role of WOCB are presented in Table 3.4. The Sobel test is a statistical method for evaluating the significance of a mediation effect. This study firstly uses the Sobel test to examine mediation, nevertheless, the Sobel test yields inaccurate results for small sample sizes (Preacher & Hayes, 2004). The result of the Sobel test ($Z = 1{,}724$; $p < 0.1$) is in the expected direction but is not statistically significant at the traditional $p < 0.05$ threshold. Nevertheless, the one-tailed significance level for the Sobel test result is within the range of $p < 0.10$. Overall, there is conclusive evidence of the existence of an indirect effect on the percentage of WOCB, albeit the effect is minimal according to the Sobel test. Furthermore, the bootstrapping method as the superior approach is used to evaluate the significance of indirect effects, and the confidence interval of the bootstrapped CIs (percentile CI = 0.054756, 0.8749123) is within the 95% percentile, in which an indirect effect exists when the bootstrap confidence intervals do not contain zero (Spencer, Adams, & Yapa, 2013). The results provide statistically significant evidence of the existence of an indirect effect on the percentage of WOCB and provide important evidence to policymakers regarding gender quota, as there is currently no mandatory gender quota in the U.S., while this study demonstrates the importance of a higher level of gender diversity for promoting environmental performance and excelling in communicating with shareholders. In conjunction with the findings of the primary test, the results support

the gender socialisation theory and suggest that few actions will be taken on the basis of environmental shareholder activists' recommendations after the withdrawal decision, even when agreements have been reached. However, a board with a high level of gender diversity could be an effective mediator in promoting the company's change on these issues.

This study theoretically and empirically analyses the effects on CEP of environmental proposals in withdrawal results. Specifically, potential indirect effects are analysed by examining the role of WOCB as a mediator. This study presents the first empirical evidence of the mediating influence of WOCB on the association between WESP and CEP. In general, the study's results indicate that WOCB plays a mediating role in boosting CEP by addressing the environmental demands of shareholder activists. Evidence is identified that WESP is positively associated with CEP, although it has no significant direct effect on its improvement. This could be due to the non-binding nature of shareholder proposals, in which a proposal has no legal restraint on subsequent acts. Despite the fact that WESP is considered a success for shareholder activists due to the firm's commitment to act on such requirements (Tkac, 2006), the future performance of the company in question remains uncertain. However, after the integration of WOCB into the model, the indirect mediation effect is statistically significant, and the CEP rises proportionally with the WOCB percentage. This demonstrates that WOCB, as a crucial mediator, provides the value of gender traits to corporate boards, where collaboration between the company and shareholder activists is reinforced, resulting in a certain level of consensus for the achievement of environmental goals and improved environmental performance.

Table 3.4 Sobel and Bootstrap test for mediation of WOCB

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.724*	0.054756	0.8749123

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

3.5.3 Additional analyses and robustness checks

This study conducts several additional analyses to examine the mediating effect of women directors. First, this study analyses the two pivotal roles of female directors, i.e., female CEOs and female CEO-Chair duality on boards in the relationship between WESP and CEP, investigating whether there is a difference between the power levels of female directors influencing the mediating function. According to Triana et al. (2014), the effects of board gender diversity and the power of female directors on the degree of strategic change are related to company performance and the power levels of women. For example, possessing authority renders directors more likely to express their thoughts and more capable of exercising their will (Westphal & Zajac, 1995). As noted by Lawrence, Mauws, Dyck, and Kleysen (2005) and Finkelstein (1992), not all directors have the same degree of influence on a firm's strategy and the intention of embracing new ideas in organisations, depending on the level of power possessed by that individual. As a result, other crucial roles of female directors on corporate boards are examined by this study,

such as female CEOs and the CEO-Chair duality. The results of the Sobel test and bootstrapped CIs for female CEOs are presented in Table 3.5 (Z = 1.479; percentile CI = -0.0810965 , 0.4582857) and female CEO-Chair duality (Z = 1.154; percentile CI = -0.1457703, 0.4232766), which provide no significant evidence of the existence of an indirect effect for women CEOs and CEO duality.

These findings conclude that only the percentage of female directors on a board exerts an indirect effect on CEP via WESP, while the power level of female directors makes no difference to the relationship between WESP and CEP. Although research suggests that with increasing authority, such as CEOs or CEO-Chair duality, an individual can influence organisational outcomes (Finkelstein & Hambrick, 1996), the findings of this study indicate that the potential of a powerful individual female director to influence a firm's operational and strategic agendas to address environmental issues is limited. This could be because women confront structural impediments that prevent them from exerting their power even when they attain executive positions. As identified by Gabaldon, De Anca, Mateos de Cabo, and Gimeno (2016), various categories of potential discrimination affect women in top positions. In addition to being nonsignificant, the mediation results for female CEOs reveal a negative correlation. It could be due to the ‘glass cliff’ phenomenon, as women CEOs are typically appointed to boards experiencing underperformance or other turmoil at the same time, and the career prospects of such an appointment are riskier (Main & Gregory-Smith, 2018), so shareholders may not place much confidence in them. In addition, the mediation results for female CEO duality also reveal a negative correlation. It may be due to role incongruency, as the characteristics of women executive directors are perceived to be incompatible with

the requirements of leadership roles (Eagly & Karau, 2002), which may also influence the perception of shareholders. However, gender diverse boards lead to more comprehensive and inclusive discussions and decision-making that consider the environmental impact of corporate actions (Kassinis et al., 2016). This implies that shareholder activists place more importance on the level of board gender diversity than on the individual competency of female directors, and that the gender effect is magnified when the proportion of WOCB is greater.

Table 3.5 Additional mediation analysis for other female director roles

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
F_CEO	1.479	-0.0810965	0.4582857
F_Duality	1.154	-0.1457703	0.4232766

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

Second, this study further explores how the industrial sector influences the mediation impact of gender diversity between WESP and CEP by testing both an environmentally sensitive industry subsample and a non-sensitive industry subsample. Distinguished by NAICS two-digit code, in our sample, companies in miming, utilities, construction, manufacturing, and transportation and warehousing industries are included in the environmentally sensitive industry subsample (Al-Shaer et al., 2022; Sila et al., 2016). Others such as wholesale trade, retail trade,

information, finance and insurance, real estate, rental and leasing, professional, scientific and technical services, administrative and support and waste services, health care and social assistance, accommodation and food services, public administration, and other service industries, are included in the environmentally non-sensitive industries subsample. All information about industries is shown in Appendix J. The results of mediation analysis using Sobel and bootstrapping methods are shown in Table 3.6. The results show that the percentage of WOCB shows a positively significant mediation effect on WESP and CEP for firms operating in the environmentally sensitive industry. It suggests that the industrial sector influences the mediation impact of WOCB between WESP and CEP, where in environmentally sensitive industries, companies show a pronounced effect of WOCB when dealing with withdrawn proposals.

Table 3.6 Additional mediation analysis for environmentally sensitive and non-sensitive industry

Environmentally sensitive industries sample			
	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	2.107**	0.0297449	1.295441
Environmentally non-sensitive industries sample			
	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	-0.022	-1.22607	1.196979

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

To evaluate the robustness of these results, this study conducts a series of robustness tests. First, the environmental committee is included as a control variable in all of the study's models, as well as the institutional blockholder ownership for robustness. Dixon-Fowler, Ellstrand, and Johnson (2017) find a positive relationship between board environmental committees and corporate environmental performance. Alda (2019) finds that institutional investors positively encourage proactive behaviour towards environmental practices. After including the additional control variables, the results hold and shown in Table 3.7 and Table 3.8.

Table 3.7 Robustness test for controlling En_committee

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.752*	0.020095	0.9336651

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

Table 3.8 Robustness test for controling lbh5

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.801*	0.0122914	1.004965

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05
*** p<0.01

Second, similar to Aiken and Lee (2020), who use WESP as a binary variable, this study uses an alternative measurement for the dependent variable as the binary variable of WESP, which is 1 when there is a WESP on the company in the given year and 0 otherwise for robustness checking in all models. The results remain constant and shown in Table 3.9. Additionally, this study uses the absolute number of female directors on corporate boards (Bear et al., 2010) to analyse the mediation effect of women directors on the link between WESP and CEP. The WOCB mediator concurs with the main results and shown in Table 3.10.

Table 3.9 Robustness test for alternative measures of dependent variable

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.784*	0.0079255	1.177837

[a] Percentile confidence interval
[b] Bias-corrected confidence interval
* p<0.1
** p<0.05
*** p<0.01

Table 3.10 Robustness test alternative measures of independent variable

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.753*	0.0068967	0.9679495

[a] Percentile confidence interval
[b] Bias-corrected confidence interval
* p<0.1
** p<0.05
*** p<0.01

Further, in accordance with the gender socialisation theory, this study argues that women directors can maximise their relational ability to collaborate with stakeholders, which can have a significant impact on the withdrawal process in order to accomplish environmental outcomes. In contrast, the mediation impact on the voting proposal will be negligible because it may not require the socialised gendered traits women possess. In order to verify this assumption and validate the theoretical contribution of gender socialisation theory to the mediation effect for WOCB between WESP and CEP, this study tests the performance of filing proposals that are filed against a company in a given year. The results show no significance for WOCB's mediating effect in the filled proposals in Table 3.11. Our propositions and hypotheses are validated by this result. Lastly, this study winsorises all the data at the 1% and 99% levels to determine whether the results are sensitive to the winsorisation operation (Moussa et al., 2020). The results remain constant and shown in Table 3.13.

Table 3.11 Robustness test with the total number of filed ESP

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	-0.311	-0.2482346	0.1749823

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

Table 3.12 Robustness test with winsored control variables

	Sobel test	Bootstrap (95% confidence intervals)	
Mediator	Z	CI(P)[a]	CI(BC)[b]
WOCB	1.679*	0.010484	0.8681801

[a] Percentile confidence interval

[b] Bias-corrected confidence interval

* p<0.1

** p<0.05

*** p<0.01

3.6 Summary and conclusion

This paper provides, to the best of our knowledge, the first empirical evidence on the mediation effect between WESP and CEP in the US, using a sample of S&P 1500 companies from 2010 to 2018. To examine the mediation effect of WOCB, the estimation of Kenny and Baron's step models, the Sobel test, and the bootstrapping method are used. The findings indicate that there is no connection between WESP and CEP, but a significant positive mediation effect of a high level of gender diversity rather than powerful women directors such as a female CEO or a female CEO duality. Additionally, the results hold for the WOCB mediation effect of subsamples of firms operating in environmentally sensitive industries. Across a variety of robustness measures and models, the outcomes are consistent.

The findings of this study contribute to the growing body of literature on shareholder activism, gender diversity, and corporate environmental performance. First, in the shareholder activism field, this study contributes to the existing literature on the effect of WESP on CEP. Because shareholder proposal is becoming an increasingly prevalent method for shareholder activists to influence and govern firms if they are

dissatisfied with the company's performance (Hirschman, 1970), their effect on company performance is receiving increased attention. However, limited research has been conducted into the issues of shareholder activism and environmental performance, with few studies focusing on environmental shareholder proposal voting and environmental practices (Flammer et al., 2021; Lee & Lounsbury, 2011; Reid & Toffel, 2009). Research on WESP and their subsequent performance is even rarer. Tkac (2006) concludes that shareholder proposals that are withdrawn prior to a vote indicate that a compromise between shareholders and management has been achieved. Nevertheless, the existing empirical evidence is not conclusive enough to demonstrate whether corporations have implemented any substantive changes desired by shareholders after the withdrawal of a proposal (O'Rourke, 2003). Hence, this study compares the results with filed proposals, providing a comparative outcome on the following actions of proposals in a filing or withdrawal status through the WOCB mediation mechanism and finding no significance with filing proposals.

Existing studies analyse the changes which can result from withdrawn proposals (Graves et al., 2001; Sjöström, 2008; Tkac, 2006), although empirical evidence about the success of withdrawn proposals has not been explored due to a lack of data (Byrd & Cooperman, 2014). Contrary to the assertion by Tkac (2006) on the quasi-equivalence of withdrawal and success, this study demonstrates that there is no significant correlation between WESP and CEP. One of the plausible reasons is the non-binding nature of the SEC rule, which has no legal ramifications for subsequent activities (Rojas et al., 2009). Another is that, according to Carleton, Nelson, and Weisbach (1998), even if an organisation can withdraw a proposal and

an agreement is made prior to the dissemination of the company's proxy statement, in some situations no agreement is achieved because the entire process is confidential. Consequently, the opaque process for withdrawal agreements obscures the effectiveness of withdrawn proposals. As suggested by Sjöström (2008), more research is needed on how companies are affected by shareholder activism. Future research can explore the rationale behind the effect of withdrawal decision and also the impact on company performance.

Second, this study expands the body of knowledge regarding the importance of WOCB in the relationship between shareholder activism and environmental performance. This study presents a more nuanced view of the impact of WESP on companies' environmental performance via the path of female directors' participation on corporate boards and demonstrates that WOCB plays a crucial role in facilitating the effective implementation of environmental practices following shareholder withdrawal decisions. It also complements ongoing research work involving current gender socialisation theory. As suggested by Clark and Crawford (2012), shareholder withdrawal proposals represent the most engaged response from corporations. This study observes a difference in a company's engagement with environmental issues when its board of directors is more gender diverse. By demonstrating that female directors bring gender traits to corporate boards, such as inclusive and interactive characteristics formed through their socialisation processes (Konrad et al., 2008).

In addition, this study has important implications for environmental shareholder activists regarding the development of stakeholder relationships with gender-diversed boards to achieve future environmental goals. This study addresses the capacity of female directors to provide practicable implications to policymakers and governments when dealing with shareholder activists. Despite the fact that a growing number of American companies are coming under public pressure to increase their boardroom gender diversity (Sila et al., 2016), there is currently no obligatory gender quota in the U.S.. Hence, policymakers could consider advancing the gender quota and particularly considering this empirical evidence when facing environmental challenges.

4. ENVIRONMENTAL ACTIVISM WITH GOVERNANCE MECHANISMS AND ENVIRONMENTAL PERFORMANCE: A FUZZY SET QUALITATIVE COMPARATIVE ANALYSIS

4.1 Introduction

As temperatures rise and climate change intensifies, the strain on the environment and human life increases (WWF, 2023). While agreement is achieved at the country level, investors and shareholders also push businesses to collaborate on climate-related concerns through a variety of means. One of them is through shareholder proposals (Denes, Karpoff, & McWilliams, 2017). The impact of shareholder activism on environmental performance has been investigated in academic studies. The majority of current publications are instructive studies (Aguilera, Aragón-Correa, Marano, & Tashman, 2021; Byrd & Cooperman, 2014; Clark et al., 2008; Michelon & Rodrigue, 2015; Monks et al., 2004; Rodrigue & Michelon, 2021; Tkac,

2006), while some provide empirical evidence (Lee & Lounsbury, 2011; Reid & Toffel, 2009), but there is still a dearth of comprehensive academic studies on such topics. For instance, the quantitative evidence of the association between ESP and CEP is deficient, and the existing research explores shareholder activism in isolation as opposed to adopting a holistic approach that investigates the linkages between environmental shareholder activism and environmental performance. In addition, because environmental proposals are non-binding and advisory to a majority vote (Levit & Malenko, 2011), the ensuing activities are not legally bound. Hence, the influence of shareholder activism on CEP has not yet been determined.

An organisation's configuration is a pattern of co-occurring characteristics across several dimensions that leads to a consistent outcome (Meyer, Tsui, & Hinings, 1993; Walker, Ni, & Dyck, 2015). This study examines the connection between the outcome of high levels of environmental performance (Fiss, 2011; Ragin, 2006) and clusters of interconnected corporate governance structures and practices, instead of a single structure or practice (Fiss, 2007). Considering that generic linear methods presume that effects are independently formed, studying configurations has become a formidable task (Greckhamer, Misangyi, Elms, & Lacey, 2008) as it emphasises configurations of interrelated parts. Hence, this study uses QCA, a configurational method that enables academics to hypothesise and empirically investigate the causal complexity more effectively (Misangyi et al., 2017). Researchers have recently begun to use the QCA method to understand the adoption of governance practices and the impact of such practices on firm-level environmental performance (Shui et al., 2022; Walker et al., 2015; Zheng, Ge, Li,

Duan, & Yu, 2020), but none of these studies have examined the influence of shareholder activism as the driving condition in configurations.

As stated by Dillard and Reynolds (2008), good governance encourages the formation of necessary organisations resulting from growing degrees of complexity through a drive towards holism and integration. This study argues that environmental shareholder activism engaging with other governance mechanisms is a configurational structure in organisations to enhance environmental performance rather than working in isolation. To embrace the possibility of more causal complexity and explore alternative means of improving environmental performance, this study aims to assess how environmental shareholder activism interacts with other governance mechanisms to affect environmental performance. This study contends that superior environmental performance results from ESP in conjunction with other corporate governance mechanisms such as a more diverse and independent board, concentrated and dominant institutional ownership, or enlarged board size. This study investigates how the configurations of governance mechanisms construct a board with specific features to address green concerns and so enhance environmental performance.

Using a sample of S&P 1500 firms from the manufacturing sector in the year 2018 with 115 firm cases, this study employs fsQCA to explore the adequate configurations for high environmental performance based on configuration theory. Fuzzy sets allow for more detailed analyses that take into account the degree of gradation between extremes (Campbell, Sirmon, & Schijven, 2016). The findings

imply that integrating ESP with other mechanisms is essential for achieving good CEP, and there is more than one ideal combination that leads to better CEP, such as the configuration paired with a high level of board gender diversity contingent on the existence of a high level of board independence and board size or the absence of other characteristics concurrently, or with the existence of a high level of board independence, board size, and institutional blockholders (IBs) in the absence of other characteristics. These findings significantly contribute to the understanding of the U.S. manufacturing sector by illuminating the connections between various pathways and improved environmental performance.

This study makes a number of significant contributions. First, despite the paucity of studies on ESP and CEP, the findings underscore the significant influence of ESP, which has been largely neglected in previous research. In order to comprehensively analyse and evaluate the relationship of ESP and governance attributes on CEP improvement, this study draws on configuration theory and employs a novel analytic technique known as fsQCA. It adds to the growing body of literature that addresses the configurational perspective on corporate governance and the related organisational environmental impacts (Aguilera et al., 2021). Second, rather than focusing on a single variable in isolation, this study examines the interplay between six key corporate governance mechanisms in different configurations of manufacturing firms, illuminating the joint reliance features of ESP and other governance mechanisms that contribute to advanced CEP. This configurational research demonstrates that the same outcome can be attained via a number of attribute combinations, which enhances the current understanding of corporate governance and its impact on environmental performance. It contends that

replicating the ‘best method’ without considering how it would work in a co-existing context may not provide the desired results. Third, this study should be useful not just to academics but also to policymakers and practitioners. Utilising an innovative methodological technique – fsQCA – it presents new avenues and insights for future research on crucial aspects of how board governance guidelines and CEP are formulated and assessed.

The remainder of the paper proceeds as follows: Section 4.2 reviews the theoretical framework. Section 4.3 discusses empirical literature review and hypotheses development. Section 4.4 describes the research design. Section 4.5 presents the results and discussion, and Section 4.6 presents the summary and conclusions.

4.2 Theoretical framework

4.2.1 Configuration theory

Configuration theory suggests that there is an optimal combination of factors within an organisation that can bring about a desired strategic outcome (Drazin & Van de Ven, 1985). From a configurational viewpoint, “organisations are best understood as clusters of interconnected structures and practices” (Fiss, 2007, p. 1180). Going beyond the traditional, linear method of examining the impact of individual factors on organisational outcomes, this configurational perspective focuses on the dynamics between the interrelated, internally consistent combinations of various elements (Figge & Hahn, 2021). A more complete picture of an organisation’s effectiveness is suggested by the configurational approach, which holds that multiple conditions act in combination as opposed to in isolation (Misangyi et al.,

2017). Organisational configurations are not arbitrary but rather indicate the finite range of conceivable types of combinations of organisational practices and structures that result in a specific organisational outcome. Therefore, equifinality is a foundational premise of configuration theory, which asserts “the possibility for several ways to lead to the same outcome” (Kulins, Leonardy, & Weber, 2016, p. 1437). In essence, they reflect the interrelated sets of causes that lead to specific business results (Fiss, 2007) and suggest that two or more distinct organisational setups can both lead to the same result.

According to configuration theory, there is an optimal set of governance mechanisms that leads to superior performance. These configurations are optimal because they represent complex "gestalts" of multiple, interdependent, and mutually reinforcing organisational characteristics that enable companies to achieve their strategic goals (Ketchen, David, Thomas, & Snow, 1993; Miller, 1996). Configuration theory has been extended to assist corporate governance and management scholars in determining the causal complexity of one desired organisational outcome (Bell, Filatotchev, & Aguilera, 2014; Crilly, 2011; Crilly, Zollo, & Hansen, 2012; Fiss, 2011; Haxhi & Aguilera, 2017; Misangyi & Acharya, 2014; Schneider, Schulze-Bentrop, & Paunescu, 2010). Our primary research question focuses on the connection between environmental shareholder activism and the configuration of other corporate governance mechanisms. Consequently, this study combines insights from configuration theory and the management literature to construct a conceptual model that connects the extent to which environmental shareholder activism is organised to the facilitation of the implementation of governance mechanisms with CEP.

4.3 Empirical literature review and hypothesis development

4.3.1 Corporate governance and environmental shareholder activism

The separation of ownership and control has been recognised as the fundamental agency problem in businesses (Berle & Means, 1932). In order to alleviate this problem, various corporate control mechanisms have been developed to align the interests of diverse parties, which forms the corporate governance system to date. Among those, shareholder activism is an approach for shareholders to exert influence over the decisions and actions of a company's management and board of directors. This includes using voting rights and other types of influence, such as public campaigns, to push for changes in company policies or leadership that align with the shareholders' interests and values (Sjöström, 2008).

In response to the filing and voting procedures for shareholder proposals, the U.S. Congress enacted Section 14 of the Securities Exchange Act in 1934, which permits the SEC to issue Shareholder Proposal Rule 14a-8 to improve soliciting regulations governing the Proxy Rules, allowing shareholders to present proposals in company proxy statements (Black, 1990). Since then, shareholder proposals have been one of the most common tactics for shareholders to influence corporate behaviour, since they can submit a proposal at the company's expense to compel a vote at the AGM if they are dissatisfied with the company's decisions (Renneboog & Szilagyi, 2011). As shareholder activism on environmental issues developed in the U.S. in the 1960s and 1970s, environmental shareholder activism has become increasingly significant over time (Rodrigue & Michelon, 2021). According to Georgeson & Co.,

environmental proposal submissions increased by 25% between 2020 and 2021, and by 46% between 2021 and 2022 (Georgeson, 2021, 2022), indicating that an increasing number of shareholders are using shareholder proposals to influence the environmental policies and practices of business, reduce the negative environmental impact, and promote sustainable business practices (Levit & Malenko, 2011).

Mandating the inclusion of shareholder proposals in proxy statements, as Liebeler (1983) argues, will increase shareholder democracy, management accountability, corporate social responsibility, and disclosure. Nevertheless, the shareholder proposal puts a price on Rule 14a-8, including the resources that management will need to devote to it and the risk that it could lead to a deceptive proposal. While the proposal method serves its intended purpose of giving shareholders a voice, it remains contentious and should be finalised and codified after taking into account all relevant factors (Liebeler, 1983). In addition, until recently, proposals submitted under Rule 14a-8 were only presented as recommendations in the U.S.. This means that, despite receiving a majority vote, the usefulness of these proposals has been questioned because they are non-binding and advisory (Levit & Malenko, 2011). Consequently, shareholders' needs may not be met, and boards may take a symbolic approach in response to shareholder requests (Thomas & Cotter, 2007). In this circumstance, the governance effect of shareholder proposals is uncertain, and the effect of ESP on the company's performance is obscure.

4.3.2 ESP and CEP

As corporate environmental footprints are monitored by regulatory, financial, and societal stakeholders, management research has shifted its attention to the potential of corporate governance as a tool for promoting environmental efforts (Aguilera et al., 2021). Although previous research has shown that some shareholder proposals have been successful in bringing about corporate environmental change (Tkac, 2006), there have only been a few empirical studies of the impact of ESP on CEP. For instance, it has been demonstrated empirically that proposal filing and voting on environmental concerns motivate firms to adopt new environmental practices, such as carbon disclosure (Reid & Toffel, 2009) and corporate pollution management practices (Lee & Lounsbury, 2011). Reid and Toffel (2009) investigate the relationship between social movements and firms' greenhouse gas emissions disclosure procedures by examining S&P 500 companies from 2006 to 2008. Using a logistic regression model, they discover a favourable correlation between shareholder proposals on climate change, environmental disclosure, and other environmental issues filed by members of the Interfaith Centre for Corporate Responsibility and public greenhouse gas emission disclosure policies. Lee and Lounsbury (2011) examine the influence of social shareholder activism on corporate pollution management practices. Using a fixed effect regression model, the authors evaluate the relationship between environmental shareholder proposals and the rate of benzene internalisation by analysing panel data from 1993 to 2005 on 58 publicly traded companies. Their findings indicate that environmental shareholder proposals have a positive impact on the pollution management practices of the targeted company.

Despite some positive corporate responses to shareholder proposals being identified in previous studies, the influence is ambiguous and inclusive, and the governance function is underdeveloped given that shareholder proposals are only advisory. Specifically, Rojas et al. (2009) suggest that, due to the non-binding nature of voting proposals, they are not necessarily conducive to a change in company policy, despite being one of the most direct ways for shareholders to communicate their concerns to corporations. It is believed that the improvement following voting on the proposition is still inconclusive. In addition, Aguilera et al. (2021) highlight that the dominant literature investigating the effect of corporate governance mechanisms on environmental performance has relied heavily on conventional statistical approaches. They criticise that such a method examines relationships between individual corporate governance mechanisms and corporate performance in terms of variables and correlations, leading to a superficial understanding of their interdependence as a governance bundle (Aguilera, Filatotchev, Gospel, & Jackson, 2008).

In response, we investigate whether sets of governance mechanisms as bundles, including ESP, board gender diversity, board independence, board size, and institutional ownership and concentration, are adequate to explain a higher level of CEP. In addition to ESP, gender diversity on the board is one of the most researched board characteristics. According to prior research, diversity results in a higher knowledge base, creativity, and invention, and is therefore a competitive advantage for corporations (Grosvold & Brammer, 2011). Ultimately, Setó-Pamies (2015) concludes that by incorporating the skills of women, businesses may have a better influence over their environmental, social, and strategic policies. However, existing

research has shown inconclusive findings on gender diversity on boards and its effect on environmental performance. Some studies demonstrate a positive and strong correlation between the participation of women on boards and CEP (Kassinis et al., 2016; Li et al., 2017; Lu & Herremans, 2019; Post et al., 2015), while Galbreath (2011) shows that female directors have no significant relationship with environmental quality. Overall, board gender diversity is a significant aspect of board characteristics, which could affect corporate environmental behaviour.

In addition, independent directors have been shown in research to be an important mechanism related to CEP (Liao et al., 2015; Post et al., 2015). Individuals who are independent have only an observable relationship with the firm and have no significant business stake in it (Coles, McWilliams, & Sen, 2001). They are less connected to management, have a longer-term perspective, and are more likely to promote sustainable growth (Johnson & Greening, 1999). In addition, studies show that they are more likely to use their skills and knowledge to improve their social status by exploring new environmental prospects and creating innovative products (O'Neill, Saunders, & McCarthy, 1989). Hence, independent directors are a strong proxy for board diligence and the board's ability to protect the firm's wealth (Beasley, 1996), and this independence is essential for the effectiveness of governance as a monitoring mechanism (Daily, Dalton, & Cannella Jr, 2003; Peng, 2004).

Additionally, researchers have highlighted the impact of board size on CEP. For instance, larger boards have more members with different backgrounds and perspectives, which increases the board's capacity to oversee and manage

corporate decision-making (Beiner, Drobetz, Schmid, & Zimmermann, 2006; Zaid, Abuhijleh, & Pucheta‐Martínez, 2020). Others argue that a large board size can make monitoring less effective due to director free riding, communication difficulties, and inefficiencies (Bushman, Chen, Engel, & Smith, 2004; Yasser, Al Mamun, & Ahmed, 2017), causing the board to become more symbolic and disregard its monitoring and control functions. In general, it has been suggested that board size plays a significant role in changing environmental performance.

Furthermore, research has shown that institutional ownership has an effect on CEP. Kock, Santaló, and Diestre (2012) argue that proactive environmental management requires substantial extra managerial work to reorganise internal systems, hence managers may not have the same views as shareholders about environmental activities. Considering that institutional investors pay greater attention to a company's strategic decisions than small shareholders, they may be able to persuade management to adopt more environmentally friendly policies. Therefore, institutional investors, as major shareholders, have more clout than other types of shareholders when it comes to making strategic, long-term, and operational decisions for a company (Coffee, 1991). Additionally, Earnhart and Lizal (2006) investigate how different types of ownership affect a company's impact on the environment and conclude that more concentrated ownership, as measured by the single largest shareholder, improves environmental performance. However, it has been argued that institutional ownership can have a negative impact on environmental performance for a variety of reasons. These include, but are not limited to, the potential for firms to prioritise short-term financial over long-term environmental sustainability, as well as a lack of specialised expertise and

resources required to effectively monitor and enforce environmental performance (Graves & Waddock, 1990).

In accordance with the increasing severity of global warming, a growing number of studies employ configurational theory to examine the effect of corporate configurations on CEP (Shui et al., 2022; Walker et al., 2015; Zheng et al., 2020). Walker et al. (2015) explore 45 existing case studies of enterprises with high CEP in order to empirically comprehend the equifinality of attaining CEP. They describe four organisational configurations for successful sustainability, including the firm's external environment, organisational structure, and strategy-related activities. Zheng et al. (2020) perform a configurational analysis on 264 of China's largest pollutant-discharge listed firms to determine what motivates environmental information disclosure. They identify three types of routes, including environmental regulation, enterprise resources, and governance capabilities, which drive environmental information disclosure. Shui et al. (2022) conduct a QCA on a sample of 250 dirty enterprises from the S&P 500 and identify six configurations, comprising board capital, ownership, and informal and formal power, that are sufficient for high environmental innovation. However, none of these studies have incorporated the factor of shareholder activism in order to study the impact of CEP.

According to configuration theory, there is an optimal combination of organisational factors that can yield the desired strategic outcome (Drazin & Van de Ven, 1985). Assessing whether a company's governance mechanisms are structured to enable environmental shareholder activism and the concurrent consideration of a number

of other mechanisms, this study proposes that, based on configuration theory, the governance mechanisms are functioning in concert rather than individually to enhance environmental performance. Therefore, this study hypothesises that:

H4.1: ESP is a crucial mechanism in governance configurations that positively increases CEP.

4.4 Research design

In order to examine the effects of corporate governance system configurations on CEP, this study applies the QCA method to evaluate complex components. It is a technique for systematic examinations of relationships between conditions (independent variables – sets in which causal conditions combine and complement each other to achieve an outcome) and outcomes (dependent variables) (Greckhamer et al., 2018; Iannotta, Gatti, & Huse, 2016; Ragin, 2000). With the QCA approach, all data is calibrated into set membership values between 0 and 1, which represent the most ideal types for each variable (Schneider et al., 2010). The rationale for utilising QCA is that organisations may not have a single mechanism for achieving high environmental performance. The QCA method is significant because it investigates a set of interrelated conditions affecting the desired outcome.

FsQCA is an extension of QCA that incorporate fuzzy-set theory to account for cases with varying degrees of condition membership (Fiss, 2011; Ragin, 2009). The rationale of using fsQCA is that, since many social science conceptions are

fundamentally vague, fuzzy sets provide more granular analyses that take into consideration the degree of gradation between these two extremes, while QCA analyses cases based on binary conditions. Therefore, this study utilises fsQCA with a quantitative element (Thomann & Maggetti, 2020), which is based on the set-theoretic method's analytical apparatus (Greckhamer et al., 2018). This measure is different from QCA's crisp sets, which rely solely on binary variables to identify theoretically meaningful membership in a set where 0 represents being entirely out and 1 represents being fully in, and the values that vary between 0 and 1 reflect the degree of membership in a particular class or set (Zadeh, 1965). FsQCA utilises a third boundary, the crossover point (0.5), defines the anchor for a qualitative distinction between being 'in' and 'out' of a set because the values of the majority of cases will not correspond to the ideal types, which is essentially accounted for by fuzzy sets. In essence, fsQCA examines the relationship between membership in causative conditions and membership in the outcome (Schneider et al., 2010). This method is congruent with the principles of fuzzy information granulation and fuzzy logic, which are believed to be fundamental to human cognition and decision-making on the grounds that everything can be a question of degree but need not be (Zadeh, 1983, 1997).

There are many reasons to employ fsQCA. First, Schneider and Wagemann (2012) argue that traditional quantitative methods are unable to provide a full picture of sustainability performance and decoupling because large-N studies use statistical methods based on linear algebra to discover the relationship between variables as the 'average' impact of X on Y (Schneider et al., 2010), but the phenomenon under study is likely to exhibit certain characteristics that correlation-based studies cannot

account for (Schneider & Wagemann, 2012). When trying to determine how various configurations of variables with different values are related to an outcome, fsQCA can be used instead of, or in addition to, linear regression analysis since it is more suited to the complex phenomena and causal relationships involved (Fainshmidt, Witt, Aguilera, & Verbeke, 2020). Inspired by set theory, Ragin (2000) fsQCA provides researchers with methods for formulating research questions and evaluating data in configurational terms.

Second, unlike traditional statistical regression method to test the causal relationship between variables, where independent factors that imply an isolated effect on the dependent variables, fsQCA was designed to identify the causal conditions in a joint presence or absence that are sufficient to produce the desired result (Fainshmidt et al., 2020). For instance, fsQCA uses Boolean algebra, which is well suited to the identification of multiple configurations of causal conditions that are sufficient for a given outcome and to the analysis of configurational complexity in small- and medium-sized samples (Ragin, 2014), but it is rare for a single causative condition to sufficiently explain the presence of a specific outcome (Fainshmidt et al., 2020). Third, since one cause rarely explains a given consequence, fsQCA permits equifinality to allow several configurations of governance mechanisms to achieve superior environmental performance (Crilly et al., 2012). Conjunctural causation occurs when a series of factors influence outcomes (Aguinis & Glavas, 2012; Margolis & Walsh, 2003). Besides, regression analysis models these interdependencies as interaction terms, but if there are more than two interactions then it becomes increasingly difficult to comprehend the results.

Furthermore, if an important independent variable is left out of a regression analysis and that variable is correlated with other variables included in the study, the coefficient estimates of those other variables will be biased. These estimations will account for a portion of the influence of the missing variable. Though omitting a relevant condition will reduce the model's explanatory power, fsQCA does not suffer from the omitted variable bias that is inherent in regression analysis, and it is possible to use a reduced set of causal conditions because the method uses Boolean algebra in which variables are true or false and operations are conducted using logical connectives of 'and' and 'or' to deal with logical relationships rather than statistical relationships. It simply evaluates whether a variable is present or not, rather than correlations, hence it will not result in an omitted variable bias (Fainshmidt et al., 2020).

4.4.1 Sample construction

As manufacturing companies have been criticised for having a larger environmental footprint (Cadez & Guilding, 2012; Jaffe et al., 1995), efforts to decrease the environmental damage they cause are of special importance. Regarding to the suggestion of Ketchen et al. (1997), configurational research focused on a single industry because if sampling from multiple industries significantly increases the number of firms required to obtain a representative sample, there are no representative samples of each subpopulation. Consequently, this study investigates S&P 1500 manufacturing companies in the U.S. for the year 2018. The S&P 1500 is a composite index comprising S&P 500 firms, S&P MidCap firms, and

S&P SmallCap firms that is representative of the population of US companies. The first sample was drawn from the Institutional Shareholder Services (ISS) database for shareholder proposals and director information, the ASSET4 database for environmental scores, and the Factset databases for ownership features. ESP are selected from the ISS database based on natural environment-related issues and themes (see Appendix A for details).

There are several reasons to select 2018 as the sample year. First, because the Paris Climate Agreement was signed in 2015, a pivotal year for climate change (Shui et al., 2022), the year 2018 is selected as the most recent year for which data was readily available due to the temporal scope of this thesis. Such a situation enables us to investigate heterogeneity after 2015. Second, the fsQCA method is case-based and initially designed for small to medium sample sizes using a set-theoretic approach ($15 < N < 40$) (Ragin, 2014). This method is based on the presence or absence of conditions, enabling the analysis of smaller samples that yield meaningful results. As small sample sizes frequently coincide with complex research questions or phenomena, causal configurations may play an essential role in exploring the nuanced relationships and interactions between conditions. Hence, fsQCA is ideally adapted to handle complexity and can reveal causal pathways and associated combinations of conditions. Now it is increasingly used for analysing larger samples (Misangyi & Acharya, 2014), and the present analysis is part of a growing trend that applies the aforementioned advantages of set theory to larger samples.

Lastly, plenty of studies use a one-year sample with the fsQCA approach. For example, Liao and Zhu (2022) investigate the effect of the interdependence and interaction of multiple factors on environmental innovation behaviour by using fsQCA. They employ data form the Shanghai Stock Exchange for the year 2018 with 123 cases. Paolone, Cucari, Wu, and Tiscini (2022) test how environmental, social, and governance pillars can affect arketing performance in the pharmaceutical industry by examining 41 European listed companies belonging to the pharmaceutical industry publicly traded in European Union (EU) stock markets in 2019. Pinto and Picoto (2016) test the configurations of the IFR, the firm's age, and risk on company performance. They use 78 FTSE 100 organisations in the UK in 2014 with the fsQCA approach. Lexutt (2020) investigates the complex factors for servitisation success by using fsQCA to conduct the German manufacturing sector in 2017 with 143 cases of companies. Consistent with the current research, this study involves 115 cases in the year 2018.

4.4.2 Outcome

CEP

A higher score for environmental performance is the outcome of this study. Environmental performance data are obtained from the ASSET4 database at Thomson Reuters. ASSET4 is a world-leading database that provides comprehensively impartial, pertinent, and systematised environmental, social, and governance information (Moussa et al., 2020). The data in this database is gathered through a systematic and consistent inspection of sources, such as sustainability reports, company websites, annual reports, media, and non-governmental

organisation reports (Ziegler, Busch, & Hoffmann, 2011). Hence, this study uses this respected database for sustainability-related studies and choose the Environmental Pillar Score as the metric. In the environmental pillar's evaluation of a company's environmental impact, the air, land, water, and entire ecosystems are all taken into account. A high environmental pillar score suggests that the rated firm has strong environmental performance. This may involve lowering carbon emissions, utilizing resources efficiently, and abiding by environmental standards. It shows that the company is taking considerable measures to reduce its negative influence on the environment and may be regarded as a leader in this field (Glossary, 2015).

4.4.3 Conditions

Governance mechanism

ESP

ESP are counted as a continuous variable (Lee & Lounsbury, 2011). The higher the number of ESP that have been targeted at a company, the deeper the engagement of environmental shareholder activists in that company's environmental issues. Shareholder voting information is from the Shareholder Proposal S&P 1500 database of ISS. Environmental resolutions are explicitly selected regarding natural environment issues and keywords **(**see details in Appendix A**)**.

Board gender diversity

To determine board gender diversity, the proportion of WOCB is computed in this study (Al-Shaer et al., 2022; Ben-Amar et al., 2017; Terjesen & Singh, 2008) using

gender information from the ISS Directors data from the ISS database. The presence of more women directors on corporate boards indicates a greater degree of gender diversity.

Board independence

The independence ratio is computed by dividing the number of independent board members by the total number of board members (Al-Shaer et al., 2022; Goranova et al., 2017). The data is retrieved from the ISS Directors data from the ISS database. The higher the number of independent board members, the stronger the independence of the board.

Board size

Board size is calculated as the total number of board members using the ISS Directors data from the ISS database (Campbell & Mínguez-Vera, 2008). If the board size is larger, then there are more board members.

Institutional ownership concentration

Two conditions are used to measure institutional ownership. Institutional blockholder (IB) is the first, and institutional ownership Herfindahl index (IOHHI) is the second. The institutional ownership information is obtained from the Factset database. IB evaluates the ownership concentration of a single firm based on institutional investors holding a significant proportion of the company's shares. It is a method for identifying shareholders who possess a substantial proportion of a

company's shares. In this study, it is defined by the percentage of the company's market capitalisation controlled by IBs (>5%) at the end of the year (Gine et al., 2017). This indicator reflects the percentage of institutional investors who own more than 5% of a company's shares. Companies with a greater number of IBs may be more susceptible to activist investors, who may exert pressure on the company's decision-making and governance procedures to implement environmental changes.

Alternatively, the IOHHI measures the concentration of institutional ownership among all institutional investors in a specific firm or industry. The Herfindahl index measures the degree to which ownership is concentrated and can take on values between 0 and 1, with higher values suggesting a more concentrated ownership structure. IOHHI is computed based on the percentage of a company's shares held by institutional investors, and it considers the entire market, not simply a single company's ownership (DesJardine et al., 2022). This metric evaluates the concentration of ownership among institutional investors and can indicate the extent to which these investors influence a company's decision-making and performance. Institutional investors may place more emphasis on sustainability and environmental performance, and companies with a higher percentage of institutional ownership may be more receptive to the demands of these investors.

Both metrics can provide useful information on the level of institutional ownership concentration, but they measure different characteristics of ownership; thus, this study uses these two conditions to obtain a comprehensive picture of institutional ownership concentration (Bøhren & Strøm, 2010). A higher IOHHI indicates a higher

concentration of institutional ownership in a corporation. In contrast, IB is a single institutional investor who owns more than 5% of a company's shares. Besides, all conditions were acquired using a 1-year time lag to reduce the possibility of reverse causation (García-Castro, Aguilera, & Ariño, 2013). The manufacturing sector is determined by the North American Industry Classification System (NAICS) code of 30-33. All outcome and conditions used are descripted in Appendix K.

4.4.4 Calibration

Calibration of the set's membership degree to get fuzzy membership scores, also known as the data calibration process, is a crucial aspect of fsQCA study construction (Zheng et al., 2020). It demonstrates distinctions between fsQCA and other statistical methods. Parameters that vary in value, kind, or categorisation are the common basis for the operation of the majority of statistical methods. FsQCA, on the other hand, operates on causal conditions or sets that vary both in 'kind' (present or absent) and 'degree' (of presence or absence). The goal of regression analysis is to predict how a dependent variable will change if the independent variable is changed by a single unit. However, researchers can determine if a given outcome's presence or absence is consistent with the presence or absence of a set of causal conditions and their combinations by using fsQCA. This type of set-theoretic approach underpins causal conditions and is central to the contemporary configurational approach and fsQCA (Fainshmidt et al., 2020). This study employs the 'direct method' of calibration (Ragin, 2010) by specifying three threshold anchors: 1 for full membership in the set, 0 for full non-membership in the set, and 0.5 for the crossover point. While researchers can extract a relevant calibration by

applying their experience, this method is more objective than manual calibration (Fainshmidt et al., 2020; Ragin, 2009). These threshold anchors are computed by the estimates of the log of full membership probabilities and transformed into fuzzy sets (Shui et al., 2022). In addition, this study has added a constant of 0.001 to prevent the software from omitting observations with an exact 0.5 membership score (Fiss, 2011). Table 4.1 provides a description of the sample.

Table 4.1 Sample descriptive analysis

Year	2018				
	Description	Measure descriptive			
		Mean	SD	Max	Min
CEP	Escore	52.096	28.116	97.625	0
Internal mechanisms					
Board diversity	WOCB	0.238	0.101	0.75	0
Board independence	IND	0.842	0.085	0.933	0.556
Board size	Bsize	10.452	1.856	16	4
External mechanisms					
Institutional ownership Herfindahl index	IOHHI	0.128	0.147	0.572	0.020
Shareholder activism	ESP	0.296	0.621	3	0
Institutional blockholder (>5%)	Ibh5	0.183	0.107	0.467	0
Number of firms		115	115	115	115

4.4.5 Necessity analysis

Configurational analysis distinguishes between required elements. The necessary condition indicates that it must be present in order to achieve a goal. The presence of sufficient conditions assures that the objective will be achieved (Fiss, 2007; Maggetti, 2014). In the first phase, all causal conditions are examined for necessity to determine whether the condition exerts a stand-alone impact on the outcome variable (Zheng et al., 2020). Two indicators are important to find the necessary condition. Consistency evaluates the proportion of cases that are consistent with the outcome, and coverage evaluates the extent to which an outcome can be attributed to a given set of causes using fsQCA (Ragin, 2017). They are computed by using the following:

$$\text{Consistency } X \subseteq Y = \sum \min(X, Y) / \sum X$$

$$\text{Coverage } X \subseteq Y = \sum \min(X, Y) / \sum Y$$

where X represents the membership score of causal conditions of cases in each configuration and Y represents the membership score of cases in the outcome set.

Table 4.2 shows that none of the listed conditions have a consistency score over 0.9, the threshold at which they are considered necessary (Schneider & Wagemann, 2012). This shows that not all causal conditions are necessary for CEP and underlines the need for additional sufficiency analysis.

Table 4.2 Analysis of necessary conditions

Outcome	Escore	
Conditions tested	Consistency	Coverage
ESP	0.761	0.688
~ESP	0.590	0.757
WOCB	0.658	0.711
~WOCB	0.602	0.627
IND	0.729	0.713
~IND	0.516	0.598
Bsize	0.699	0.751
~Bsize	0.534	0.558
Ibh5	0.506	0.583
~Ibh5	0.740	0.727
IOHHI	0.547	0.637
~IOHHI	0.697	0.678

Note: ~ indicates 'negation', which refers to the absence (low level) of outcome and conditions.

4.4.6 Truth table and sufficiency analysis

The following step is to examine if there is a causal sufficiency relationship between the various causal conditions and the outcomes, which will lead us to the optimal configurations for environmental performance. Table 4.3 is the truth table, which is a data matrix that provides all conceivable logical combinations, and includes a list of all logically viable configurations (Pinto & Picoto, 2016). It comprises 2^k rows, where k is the number of causal conditions (Fiss, 2011). QCA is typically an appropriate choice for sample sizes of 12 or more, according to the number of causal

conditions included in the model (Marx, 2006), and avoid models containing more than seven causal conditions (Fainshmidt et al., 2020). This study contains six causal conditions, which fits the requirement. Three widely used criteria – frequency, proportional reduction in inconsistency (PRI), and consistency threshold – are frequently applied to further restrict the truth table to logical combinations with the predicted results. Frequency refers to the number of firms that must be observed in a truth table row in order for it to be regarded as reliable empirical evidence (Bedford, Malmi, & Sandelin, 2016). To prevent drawing conclusions from a solitary sample, this threshold is set at two firms (Bell et al., 2014; Fiss, 2011; Greckhamer, Misangyi, & Fiss, 2013; Maggetti & Levi-Faur, 2013). After removing all instances that are consistent for both the presence and absence of the result, PRI represents the remaining consistency of the evidence for the subset connection (Misangyi & Acharya, 2014). PRI is set at 0.7 (Shui et al., 2022)[4]. Consistency refers to the extent to which situations correspond to the set-theoretic connections given by a solution (Fiss, 2011). Following Ragin (2014), consistency criterion is set at a minimum of 0.80 in the truth table to discover configurations that are reliably related to the outcome[5]. In addition, the truth table technique enables researchers to address the issue of limited variety by differentiating between parsimonious and intermediate solutions based on both simple and complex counterfactuals because they incorporate counterfactuals such as logically feasible combinations that are not visible in the empirical data (Ragin, 2009). Primarily, this study uses intermediate

[4] This study additionally tests the stricter set at 0.75 in accordance with Ragin (2010), and the results retain the core attributes.

[5] This study additionally tests beyond the truth table's minimal consistency criterion at 0.85. The insensitivity of the results to the use of different cutoffs suggests that the study is robust (Bedford et al., 2016).

solutions incorporating parsimonious assumptions (Fiss, 2011; Ragin, 2009; Ragin & Sonnett, 2004).

Table 4.3 Truth table for the outcome performance (logical remainders not listed)

ESP	WOCB	IND	Bsize	lbh5	IOHHI	No. of cases	CEP	Raw consistency	PRI consistency
1	1	1	1	0	0	6	1	0.975	0.928
1	1	0	1	0	0	3	1	0.967	0.863
1	1	1	1	1	0	2	1	0.931	0.746
1	0	1	1	1	0	3	1	0.929	0.744
1	1	0	0	0	0	2	1	0.947	0.737
1	1	1	1	0	1	6	1	0.913	0.733

Notes: All conditions and outcomes are in high levels.

No. of cases indicates the number of the U.S. companies with greater than .5 membership in that combination of conditions.

Raw consistency represents the proportion of cases in each truth table row that displays the outcome.

4.5 Results and discussion

4.5.1 Main results and discussion

FsQCA calculates several measures of coverage. The overall solution coverage measures the percentage of outcome samples covered by all solutions (Rihoux & Ragin, 2008). Raw coverage indicates the proportion of total membership in high firm environmental performance explained by each particular combination of mechanisms where some firms may be covered by more than one governance configuration in the solution. Unique coverage refers to the proportion of

membership to the outcome. This coverage is attributable only to the particular configuration where firms that are not covered by any other governance configurations (Ragin, 2006). In short, coverage is a measure of empirical relevance and unique coverage shows the relative importance of each particular configuration (Fiss, 2011). In addition, the overall solution consistency expresses the degree of consistency between the outcome and the samples (Bedford et al., 2016). Table 4.4 presents the results for high-CEP configurations. Overall solution coverage suggests that 54.4% of high environmental performance can be attributed to the three configurations, and overall solution consistency suggests that the three configurations have 90.5% explanatory power for high CEP, both exceeding the threshold values of 0.30 and 0.75, respectively (Woodside, 2013). The results indicate equifinality, meaning that different causal conditions lead to high environmental performance (Pinto & Picoto, 2016).

Table 4.4 Sufficient configurations for high performance

	High CEP		
	1	2	3
ESP	●	●	●
WOCB	⬤	⬤	
IND	⊗	⬤	⬤
Bsize		⬤	⬤
Ibh5	⊗	⊗	●
IOHHI	⊗		⊗
Consistency	0.944	0.935	0.933
Raw coverage	0.259	0.362	0.289
Unique coverage	0.087	0.151	0.094
Overall solution coverage			0.544
Overall solution consistency			0.905

Note: ⬤ = core causal condition present; ● = peripheral causal condition present; ⊗ = core causal condition absent; ⊗ = peripheral causal condition absent

This study adheres to the notation employed by Fiss (2011), where '●' denotes the presence of an attribute, '⊗' represents its absence, and a blank space indicates that a given attribute is not causally connected to the outcome. Further, core attributes that are present in both the parsimonious and intermediate solutions are represented by bigger circles, whereas peripheral attributes that are present

exclusively in the intermediate solutions are represented by smaller circles (Haxhi & Aguilera, 2017).

The results in Table 4.4 demonstrate that, although being a peripheral attribute, ESP is present in all configurations and incorporates other kinds of conditions, which supports Hypothesis 4.1 and suggests that ESP is a critical governance mechanism for a US-based manufacturing company to improve its environmental performance.

Configuration 1 is the closest to the ideal type of governance mechanism model. This study labels this configuration as '*ESP with WOCB in dispersed ownership structure*'. The consistency of Configuration 1 (ESP***WOCB***~IND***~Ibh5***~IOHHI**) is 0.944, and its raw coverage is 0.259, which means that having this configuration, the company will have a 94.4% possibility of achieving high environmental performance. This configuration demonstrates that firms with a greater number of environmental proposals targeted, a greater proportion of women on corporate boards, the absence of a high level of board independence, the absence of a high level of IBs (>5%), and the absence of a high level of institutional ownership concentration will have a high level of environmental performance. In this configuration, WOCB, ~Ibh5, and ~IOHHI are essential components for achieving a high CEP, and ~IND and ESP are peripheral components. Companies with Configuration 1 are characterised by low institutional concentration and low board independence, but high gender diversity and environmental shareholder activism. It means that without the oversight of institutional investors and independent directors, these enterprises might work effectively towards environmental improvement if

women directors and environmental shareholder advocates collaborated properly. The example cases for such companies are *Honeywell International Inc (HON)* and *Chevron Corporation (CVX)* in this sample.

WOCB, IND, and Bsize are core attributes in Configuration 2 (ESP*__WOCB__*__IND__*__Bsize__*~Ibh5), while ESP and ~Ibh5 are peripheral attributes. This configuration is labelled as '*ESP with WOCB in an inclusive board structure'*. This configuration has a consistency value of 0.935 and a raw coverage value of 0.362. This configuration demonstrates that firms with a greater number of environmental proposals targeted, a greater proportion of women directors on corporate boards, a greater level of board independence, a larger board size, and the absence of high IBs (>5%), will have superior environmental performance. Consistent with Configuration 1, the active environmental shareholders also incorporate a high level of board gender diversity and little institutional ownership in these companies. However, in these firms, the effects of board independence and board size have jointly and largely affected the CEP. *Mondelez International Inc. (MDLZ)*, *Deere & Company (DE)*, *Becton Dickinson and Co. (BDX)*, *Cisco Systems Inc. (CSCO)*, *Altria Group Inc. (MO)*, *Merck & Co. Inc. (MRK)*, *Pfizer Inc. (PFE)*, and *Exxon Mobil Corp*. *(XOM)* are examples of firms operating under this configuration.

In Configuration 3, (ESP*__IND__*__Bsize__*Ibh5*__~IOHHI__), IND, Bsize, and ~IOHHI are the fundamental characteristics, whereas ESP and Ibh5 are peripheral elements. This configuration is labelled as '*ESP without WOCB in a supervision structure*'. The consistency of this configuration is 0.933, and its raw coverage is 0.289. This

configuration demonstrates that firms with a greater number of targeted environmental proposals, greater board independence, a larger board size, a greater proportion of IBs (>5%), and the absence of a high concentration of institutional ownership will have superior environmental performance. In contrast to the previous two configurations, these companies' boards have little gender diversity. Besides, environmental shareholder proposals have been incorporated with a high portion of individual IBs having more than 5% ownership. Similar to Configuration 2, high board independence and board size act once again in Configuration 3, but in a low institutional ownership concentration context. The example firms in this sample are *Baxter International Inc. (BAX)*, *Biogen Inc. (BIIB)*, *Eastman Chemical Co. (EMN)*, and *Northrop Grumman Corp. (NOC).*

4.6 Summary and conclusion

This study seeks to comprehend the relationship between environmental shareholder activism and a firm's environmental performance. It examines whether combining ESP with five other important antecedent governance mechanisms, i.e., board gender diversity, board independence, board size, institutional ownership, and institutional concentration, might successfully reflect high environmental performance. The findings of this study enhance the understanding of the role of ESP on CEP. By integrating the ESP function with these five other antecedents, this study contributes to the growing body of literature that aims to provide a more comprehensive analysis of the typologies influencing a firm's environmental performance.

Multiple factors can affect the intricate interaction between governance mechanisms (Walls et al., 2012). In the discussion, this study investigates the configuration from both the perspective of the presence (Configurations 1 and 2) and absence (Configuration 3) of women on the board of directors. First, this study examines Configurations 1 and 2, labelled '*ESP with WOCB in a dispersed ownership structure*' and '*ESP with WOCB in an inclusive board structure*', which both have high board gender diversity and active environmental shareholder engagement. For Configuration 1, it shows that high board gender diversity and low institutional concentration achieve a high CEP when environmental shareholder activists are actively involved in these companies' environmental issues. This is consistent with the notion that a more diverse board can bring a broader range of viewpoints and approaches to decision-making and a stronger consideration of stakeholder interests, leading to a better consideration of environmental concerns and issues (Kassinis et al., 2016; Post et al., 2015). Furthermore, this finding implies that a more dispersed and varied ownership structure can improve a company's environmental performance. Such a dispersed ownership structure may make it easier for stakeholders to engage with the company on environmental issues and enable the corporation to consider the concerns of a broader variety of stakeholders (García-Sánchez, Aibar-Guzmán, & Aibar-Guzmán, 2020).

For Configuration 2, it shows that high board gender diversity, high board independence, and a large board size achieve a high CEP when environmental shareholder activists are actively involved in these companies' environmental issues. This configuration shows that independent board members are less likely to be swayed by management and may be more willing to examine environmental

hazards and opportunities (Coles et al., 2001), especially when combined with larger boards that have more resources for monitoring and oversight, which improves environmental performance (Beiner et al., 2006). Besides, this setup suggests that US manufacturing companies with larger, independent, and diverse corporate boards demonstrate an inclusive board feature, as a larger board accommodates more diverse talents and independent directors who have no affiliation with the company. It implies that such a board may be more receptive to different viewpoints and more willing to accommodate a wide range of abilities, making it more inclined to prioritise environmental concerns. Contrary to the assumption that concentrated ownership could lead to a high CEP (Kock et al., 2012), both configurations are absent from significant blockholders, indicating that dispersed ownership increases managers' sensitivity to environmental issues (García-Sánchez et al., 2020).

Second, this study examines Configuration 3, which is without gender diversity on the board and is labelled as '*ESP without WOCB in a supervision structure'.* High board independence and a larger board size work in tandem to achieve high environmental performance with a high level of environmental shareholder activism. Noticeably, IBs with more than 5% of the company's shares have presented for the first time in this configuration. As in this design, a more controlling and supervisory governance structure has been shown with the high authority of a single blockholder (Earnhart & Lizal, 2006), who may influence and supervise management to undertake environmentally friendly practices (Kock et al., 2012) in conjunction with other conditions except WOCB.

This study extends the corporate governance and CEP link by concentrating on environmental shareholder activism and the U.S. manufacturing industry from a configurational vantage point for the first time. Drawing on previous corporate governance and CEP research that has already appropriately supported a configurational approach, such as exploring bundles of governance mechanisms (Aguilera, Desender, & Kabbach de Castro, 2012; Rediker & Seth, 1995), the configurations this study unveils and the theoretical explanations it uses can serve as reference points for the development of future studies. For example, to extend extant research associated with high CEP, the condition of WOCB or dispersed institutional ownership that argued to increase the firm's commitment to environmental sustainability (García-Sánchez et al., 2020) could be further investigated in conjunction with environmental shareholder activism.

In addition, this research provides significant implications to practitioners and decision-makers on constructing corporate governance structures to enhance CEP in the U.S. manufacturing industry. It is important for the practitioners and decision-makers of a company to understand that the key to improving the company's CEP is not through a single governance attribute, but the interplay of different governance mechanisms. They should be aware, however, that incorporating additional governance mechanisms comes at a high cost and with diminishing marginal returns while reaping benefits from mutually improving governance systems (Shui et al., 2022). According to this study, to improve CEP, practitioners may need to concentrate more on companies involved with environmental shareholder activists. In this case, the corporate board needs to make room for a wider range of opinions by increasing the number of women on the board, making the board bigger and

more independent, or spreading institutional ownership to improve the company's environmental performance.

5. CONCLUSION

5.1 Introduction

This thesis explores the role of gender diversity in corporate environmental performance during the shareholder activism process. The research objectives are to: (1) to examine the relationship between different executive roles taken by women directors on corporate boards (e.g., women general directors on boards, CEOs, and CEO-Chairs) and ESP at different stages (e.g., ESP filed and withdrawn); (2) to explore the mediating role of WOCB in the association between WESP and subsequent CEP; and (3) to conduct a comparative analysis of the high level of CEP caused by ESP, WOCB, and other governance mechanism configurations of US manufacturing companies. The research objectives are achieved through three separate but interrelated studies. This chapter summarises the key findings of the three studies, reflects on the broader implications of the research, discusses the limitations, and offers future research recommendations.

5.2 Summary of the thesis

The first study examine the relationship between WOCB and ESP from 2010 to 2018. Using gender socialisation theory, it investigates how WOCB influences the way shareholder activists target the firm. Gender socialisation theory suggests that women and men acquire different values and social expectations. This leads to variations in their value orientation, whereby women directors are more concerned with environmental sustainability due to their socialised altruistic traits from socialisation and life experience. Complementing with managerial power

perspective, this study also demonstrates that when women hold more influential positions on the board of directors, the socialised impetus of shareholders shifts away from patriarchal norms, and towards close collaboration and effective communication. This study uses the LPM with industry, company, and time fixed effects to explain the effect of WOCB, and uses a two-step system GMM model to minimise endogeneity.

The second study explores the mediating role of WOCB in the association between WESP and CEP from 2010 to 2018. Due to the non-binding nature of shareholder proposals in the U.S., such proposals have limited impact on corporate environmental change, making it difficult to influence firms' strategies and business operations. Gender socialisation theory suggests that women may have different perspectives and values than men due to their socialisation experiences, and these differences may influence their behaviour and decision-making. WOCB may help reconcile a firm's relationship with its stakeholders, given the difficulty of rapidly implementing environmental actions. This study uses causal steps model (Baron & Kenny, 1986) for mediation analysis, and the Sobel test as an alternative 'product-of-coefficients' approach to Baron and Kenny's mediation model based on the asymptotic standard error of the indirect impact. This study also uses the bootstrapping test of mediation to assess the indirect effects of WOCB on the relationship between WESP and CEP.

The third study investigates the association between ESP and CEP. It uses configuration theory and fsQCA to empirically investigate the causal complexity of

corporate governance mechanisms on the CEP. By considering the configuration of factors rather than just their individual effects, configuration theory can help identify the most effective combinations of factors in promoting CEP. This study examines the interplay between six key corporate governance mechanisms in different configurations for US manufacturing firms. It reveals that more than one ideal combination exists which leads to better CEP. Further, integrating ESP with other mechanisms is essential for achieving better environmental performance.

5.3 Research findings and implications

This thesis implies that at the stage of targeting companies, environmental shareholder activists consider powerful women directors to have significant roles in promoting collaboration on and communication about environmental issues between environmental shareholder activists and the company, and that the perception of environmental activists' socialised impetus shifts from gender bias to credibility during the withdrawal process of proposals. The empirical evidence in the second paper confirms that a high level of gender diversity on corporate boards plays a significant mediating role in coping with environmental activists' demands and taking additional actions on the next stage of action execution. Although powerful women directors have no effect at this stage of execution, they have no effect on the perception of environmental shareholder activists during the targeting stage. It may be due to the prevalence of gender stereotypes in management, whereby influential women may not be able to exert more influence due to hurdles in leadership roles. When multiple governance mechanisms interact with environmental shareholder activism, a more sustainable outcome is achieved.

Specifically, the first study examines the association between WOCB and ESP. The results show that women general directors have no significant influence on ESP, while firms led by women CEOs exhibit a positive relationship with WESP. Women CEO–Chair duality and both ESP are significantly and positively correlated. Women CEOs are also more likely to reach withdrawal decisions on ESP. Finally, the possibility of filing an ESP increases when women take significant positions on corporate boards, as firms with a women CEO-Chairs on the board are more appealing to environmental activists. The study has substantial implications for policymakers, government, corporate management, and boards of directors. As the current proportion of women directors and firms with women executives remains low, the findings suggest that firms confronting environmental shareholder activism may be able to change their behaviour on environmental-related issues by promoting women to significant roles. For instance, when formulating policy for gender quotas, policymakers should consider not only the percentage or number of women directors, but also their authority and position.

Next, the second study finds no direct effect of WESP on CEP, but a positive mediating influence of WOCB. Further, the women directors' power level makes no difference in the relationship between WESP and CEP. Notably, a gender diverse board seems more open to discussing board and corporate issues, and exhibits inclusive tendencies. This indicates the board's greater willingness to listen to and consider the concerns of a wider range of stakeholders, and a greater interest in fostering connections with environmentally concerned shareholders. In addition, this

study shows that women directors play a significant role in firms operating in the environmentally sensitive industries. This study has significant implications for environmental shareholder activists regarding the development of stakeholder relationships with gender-diverse boards in order to achieve future environmental objectives. This study examines the capacity of female directors to provide policymakers and governments with actionable insights when dealing with shareholder activists especially in environmentally sensitive industries. Although an increasing number of U.S. companies are facing public pressure to increase boardroom gender diversity (Sila et al., 2016), there is no mandatory gender quota in the U.S.. Consequently, policymakers could consider advancing the gender quota and examine this empirical evidence in particular when confronting environmental challenges.

Finally, the third study explores how environmental shareholder activism interacts with other governance mechanisms to improve environmental performance. The results show that ESP is the common condition in conjunction with other corporate governance mechanisms and find three ideal configurations for U.S. manufacturing firms. Specifically, to achieve a high CEP, two configurations have more environmental shareholder activism and high board gender diversity. The first configuration has low institutional concentration, while the second has high board independence and a large board size. The third configuration results in superior environmental performance, and has high environmental shareholder activism and absence of high board gender diversity together with high board independence and a larger board size. Overall, this study has significant implications for practitioners

and decision-makers regarding the construction of corporate governance structures to improve CEP in the U.S. manufacturing sector. Practitioners and decision-makers of a company must recognise that the key to improving the company's CEP is not a singular governance attribute, but rather the interaction of multiple governance mechanisms. This study suggests that, in order to enhance CEP, practitioners may need to focus more on companies with environmental shareholder activists. In this instance, the corporate board must make room for a broader spectrum of opinions by increasing the number of women on the board, making the board larger and more independent, or distributing institutional ownership to enhance the company's environmental performance.

In conclusion, this thesis contributes to the literature on gender diversity, environmental shareholder activism, and CEP. The first study provides, to the best of our knowledge, the first empirical evidence on the effect of different women executive roles on environmental shareholder activism. It advances the understanding of how gender diversity affects environmental shareholder activism by incorporating gender socialisation theory and the managerial power perspective. While research primarily examines the effectiveness of female CEOs on shareholder proposals (Francis et al., 2021; Gupta et al., 2018; Jackson et al., 2021), this study offers a comprehensive view of how different executive roles held by women (e.g., women general directors on boards, CEOs, and CEO-Chairs) affect environmental shareholder activism in different phases (e.g., ESP filed and withdrawn). Studies show that environmental activists have multiple considerations, such as role incongruency, gender discrimination bias, the ‘glass cliff’ phenomenon,

or transformational leadership style, when deciding to target a firm with women directors (Francis et al., 2021; Gupta et al., 2018; Jackson et al., 2021). However, none have investigated it from a gender socialisation perspective. This study advances the social-psychological significance of WOCB in shareholder activism and concludes that gender socialisation is the primary reason for attracting the attention of environmental shareholder activists and promoting effective communication with environmental activists. Further, this study fills the research gap on the relationship between vital women directors and withdrawn shareholder proposals. It contributes to the gender diversity and WESP literature by showing that the positive results on WESP address the effective engagement of women directors with activist shareholder groups. This indicates that women directors in a powerful position amplify gender traits and are targeted due to their strong communication and interpersonal skills when dealing with shareholder activists.

Addressing the scarcity of empirical research on shareholder proposals and CEP, this study advances the literature regarding the importance of WOCB in the relationship between shareholder activism and environmental performance. As WESP indicates shareholders' success and shows a concession by management (Marquardt & Wiedman, 2016), the second study further investigates the relationship between WESP and CEP. Further, to explain the mediating impact of WOCB, this study uses the social psychology theory of gender socialisation. It reveals a potential mechanism by which a firm led by female directors can respond to environmental shareholder activists in the context of the non-binding voting system in the U.S. Furthermore, it provides a means of examining whether

environmental shareholder activist groups and women directors collaborate to improve environmental performance after a withdrawal results. Essentially, this study provides, to the best of our knowledge, the first empirical evidence that the presence of WOCB plays a conductive role in the relationship between WESP and CEP, and suggests that having a gender-diverse board is an effective strategy for companies to mitigate the deterrence of shareholder activists. A gender diverse board shows a more inclusive and interactive environment to engage with shareholder activists, where the potential of a powerful individual woman director to influence the firm's operational and strategic agendas addressing environmental issues is limited.

Besides using statistical regression to test the relationship between WOCB, environmental shareholder activism, and CEP, this study extends the literature addressing the association between environmental shareholder activism and WOCB with other governance mechanisms on CEP from a configurational perspective (Aguilera et al., 2021). Concentrating on the U.S. manufacturing industry, this study reveals three configuration outcomes: '*ESP with WOCB in a dispersed ownership structure',* '*ESP with WOCB in an inclusive board structure*', and '*ESP without WOCB in a supervision structure'.* These configurations provide reference points for the development of future research. Furthermore, this study contributes to the research on corporate governance and CEP that to achieve a high CEP. The results show that the condition of WOCB or dispersed institutional ownership can help increase the firm's commitment to environmental sustainability (García-Sánchez et al., 2020) together with environmental shareholder activism and

the significant influence of ESP in configurations contributing to a high CEP is addressed.

Theoretically, this thesis extends gender socialisation and configuration theories in the interrelated disciplines of gender diversity, shareholder activism, and CEP. It emphasises the importance of WOCB in collaboration with environmental shareholder activists based on their gender traits, how managerial power enhances gender socialisation, and the significance of employing configurational analysis to investigate a complex governance effect on corporate performance. This thesis particularly helps address the lack of research on WESP by undertaking a comprehensive analysis of gender diversity and WESP, and the role of WOCB in the relationship between WESP and CEP. Based on gender socialisation theory, it addresses the significance of WOCB when confronted with ESP in withdrawal and filed decision. Theoretically, it reveals that powerful female directors may shift the impetus of shareholder activists' social impetus, whereas a gender-imbalanced board and boards with influential directors may be unable to advance environmental performance. This study also complements ongoing research efforts on gender socialisation theory by demonstrating that women directors bring particular gender traits to corporate boards, such as the inclusive and interactive characteristics formed through their socialisation processes (Konrad et al., 2008; Nielsen & Huse, 2010b). These benefits contribute to the development of stakeholder relationships and future environmental performance, particularly when facing environmental challenges. In addition, this research underscores the significant influence of ESP, which has been largely neglected in previous research, and contributes to the

research on WOCB, ESP, and CEP through its configurational investigation. It also contributes to the understanding of the U.S. manufacturing sector by illuminating the connections between various pathways and improved environmental performance.

Practically, this thesis helps firms advance the status of WOCB and address the growing concerns of environmental activists. Decision-makers should consider the importance of women executives in smoothing the deterrence of environmental shareholder activism. A growing number of U.S. companies are under public pressure to increase gender diversity in the boardroom, as there is no mandatory gender quota in the majority of the U.S. currently (Sila et al., 2016), and under the threat of environmental shareholder activism. In this context, this research provides valuable suggestions to decision-makers with empirical evidence on the effectiveness of WOCB when facing environmental shareholder activists. Furthermore, it reveals new avenues and insights for future research on improving corporate structures to improve CEP. Specifically, it underlines that corporate decision-makers should realise that enhancing the company's CEP is not the result of focusing on a particular governance attribute but rather on the interaction of a variety of governance mechanisms. However, incorporating additional governance mechanisms comes at a high cost and with diminishing marginal returns while reaping benefits from mutually improving governance systems (Shui et al., 2022). Practitioners may need to concentrate more on the governance mechanisms of environmental shareholder activists and gender diversity. In addition, this study provides evidence to policymakers on the gender quota, who should consider the effect of WOCB in different conditions and positions. For example, while powerful

women contribute to deterring environmental shareholder activists, the percentage or the number of women directors on corporate board provides an inclusive environment for advancing environmental performance. Thus, gender quotas should not only just focus on the percentage of board members who are women but also consider the power of their influence. Furthermore, environmental shareholder activists should consider that a gender diverse board may be more likely to achieve environmental goals and consider the stakeholders' environmental needs.

5.4 Limitations and future research recommendations

This thesis has some limitations. First, this thesis focuses on the U.S. market for investigating gender diversity, shareholder activism, and CEP. This is because the U.S. has been the primary country polluting the environment since the 1880s (Evans, 2021), and has no mandatory gender quotas for women directors' presence on corporate boards. Besides, shareholder proposals have been prevalent in the U.S., and the SEC has published Rule 14a-8 under the Securities Exchange Act of 1934 for soliciting proposals' procedures. However, the outcome of the vote is not legally binding on the company. Consequently, the U.S. market appears ideal for this research to investigate the influence of shareholder activism on CEP, and the effect of WOCB. However, because the data for this thesis are restricted to the U.S. S&P 1500 companies, the findings may not be generalizable to all companies worldwide. For example, due to the institutional, cultural, and regulatory characteristics of European markets (Horster & Papadopoulos, 2019), European companies have received less ESP (Cziraki et al., 2010). Besides, Europe has different situations from the U.S. whereby the former relies on exogenous,

government-imposed quotas to direct the board's actions, whereas the U.S. has a non-binding law for proposals (Perrault, 2015). With available data, future research can explore the extent to which the results may be generalizable to other developing or developed countries without mandatory gender quotas and non-binding shareholder proposal laws, such as Australia and Canada.

Second, this thesis uses a quantitative method. However, the application of quantitative analysis has been debated for years. For example, as the world is complex and dynamic, the quantitative method may fail to communicate uncertainty (Fogel, 1975). Quantitative indicators have limitations in producing informative results if the variables have not been well-measured (Jerrim & de Vries, 2017). This thesis, for instance, uses environmental scores from the Asset4 database to measure CEP. Though the Asset4 database is highly recognised as a representative assessment of a firm's true environmental performance (Ribando & Bonne, 2010), some limitations remain in using it to measure a company's environmental performance. For instance, the quality of environmental data may vary depending on the source, accuracy, and timeliness of the information. Though the Asset4 database is gathered through a systematic and consistent inspection of sources, such as sustainability reports, company websites, annual reports, media, and non-governmental organisation reports (Ziegler et al., 2011), companies may report data differently or may not provide complete information. This can affect the comparability and reliability of the environmental scores. Besides, although this database considers sufficient environmental aspects (Glossary, 2015), the environmental scores may not cover all aspects of a company's environmental

performance, such as local community impact, site-specific issues, or other environmental risks not included in the standard metrics. Further studies can combine Asset4's environmental scores with other data sources or use a broader range of metrics to evaluate a company's environmental performance.

In addition, using statistical regressions and testing statistical significance has limitations (Schneider, 2013). As discussed by Jerrim and Vignoles (2013), statistical significance cannot rule out other possible uncertainties where unrepresentative samples, missing information, and poorly measured data pose a much greater threat to results. Although this thesis has used a range of sensitivity analyses and alternative regression models to test the fitness of model estimations and reduce endogeneity, the limitations of the quantitative method with regressions are inherent. To address this limitation, this thesis has adopted a qualitative comparative method in the third study, fsQCA, in the third study to investigate the relationship between governance mechanisms and CEP. This method uses Boolean algebra to identify complex causal conditions, which is different to statistical regression. It demonstrate a joint presence or absence that are sufficient to produce the desired result. Variables are true or false, and operations are conducted using logical connectives of 'and' and 'or' to deal with logical relationships rather than statistical relationships (Fainshmidt et al., 2020). As a qualitative comparative analysis, this method can also be incorporated with case studies to further investigate the ideal configurations produced by the truth table. Future studies can expand the conditions in the configurations or use qualitative methods to explore whether and how such configurations work based on the results of configurations

generated in the third study, such as the configuration of dispersed institutional ownership combined with ESP on CEP.

Finally, the sample for this thesis is from the S&P 1500 companies, which comprises S&P 500 firms, S&P MidCap firms, and S&P SmallCap firms, and is representative of the population of US companies. In addition, this thesis only spans the years 2010–2018 due to data availability. Further studies can use a larger sample size, and acquire the most recent data to test the validity of the results and compare the differences.

6. APPENDIX

Appendix A: Environmental proposals selection process for the thesis

Areas	Issues	Key words
Environment		
Climate change	Renewable resources, climate change action and reporting, emissions management and reporting.	Renewable, methane, solar, oil, wind, gas, Climate, 2 degrees, green, global warming, clean power, Paris Agreement, emission, GHG, fuel, carbon, coal and mining.
Ecosystem Service	Access to land, water, forest, wood, effluent, mountain and coast.	Water, forest, land, wood, natural, effluent, mountain, and coast.
Environmental management	Environmental standards and impact, pollution control, recycling, energy efficiency, waste management, sustainability activities and reporting.	Environmental, plant closure, hydraulic fracking, hazard, toxic, chemical, pollution, radioactive, nuclear, petrochemical, recycle, plastic, energy efficiency, electronics, waste, sustainability, ESG, and CSR.

Appendix B: The process of merging database for Chapter 2

Database	Information	Period	firms
ISS Shareholder Proposal S&P 1500	Shareholder proposals (initial dataset)	2010-2018	904
ISS Directors	Board characteristics	2010-2018	813
BoardEx	Board characteristics	2010-2018	794
CompustatFund	Financial	2010-2018	712
Factset	Accounting	2010-2018	684
Asset 4 ESG Score	Environmental performance	2010-2018	504

Appendix C: The frequency of ESP filed each year for Chapter 2

	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018
ESP	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)
0	117	129	146	159	158	176	198	198	193
	(62.57)	(71.67)	(71.92)	(73.95)	(69.60)	(72.73)	(74.16)	(72.79)	(70.70)
1	70	51	57	56	69	66	69	74	80
	(37.43)	(28.33)	(28.08)	(26.05)	(30.40)	(27.27)	(25.84)	(27.21)	(29.30)
Total	187	180	203	215	227	242	267	272	273

Appendix D: The frequency of ESP withdrawn each year for Chapter 2

	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018
WESP	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)	Freq (Percent)
0	149	154	175	186	176	213	235	237	232
	(79.68)	(85.56)	(86.21)	(86.51)	(77.53)	(88.02)	(88.01)	(87.13)	(84.98)
1	38	26	28	29	51	29	32	35	41
	(20.32)	(14.44)	(13.79)	(13.49)	(22.47)	(11.98)	(11.99)	(12.87)	(15.02)
Total	187	180	203	215	227	242	267	272	273

Appendix E: VIF analysis for Chapter 2

Variable	VIF	1/VIF
Size	2.69	0.372286
F_Duality	2.09	0.477919
F_CEO	2.09	0.477987
TDC1	1.67	0.597022
En_score	1.64	0.611261
Ibh_5pct	1.38	0.724144
Board_Size	1.36	0.734521
Profitability	1.21	0.829546
Leverage	1.12	0.896282
WOCB	1.11	0.897760
Sponsor	1.08	0.926713
Withd_ESP	1.06	0.942488
En_Committee	1.04	0.961926
Mean VIF	1.50	

Appendix F: Variables used in Chapter 2

Variable	Abbreviation	Definition	Source
Environmental shareholder proposals filed	ESP	A binary variable that takes the value of 1 if at least one environmental shareholder proposals filed in the given year	Gupta et al. (2018) and Francis et al. (2021)
Environmental shareholder proposals withdrawn	Withd_ESP	A binary variable that takes the value of 1 if at least one environmental shareholder proposals withdrawn in the given year	Bauer, Moers, & Viehs (2015)
Women on corporate boards	WOCB	The percentage of women general directors to board size	Atif, Alam, & Hossain (2020), Cordeiro, Profumo, & Tutore (2020), He & Jiang (2019)
Female CEO	F_CEO	A binary variable that takes the value of 1 if the inside CEO is female, 0 otherwise	Atif et al. (2020), Gupta et al. (2018), Shahab et al., (2020)
Female CEO-Chair duality	F_Duality	A binary variable that takes the value of 1 if the inside CEO-Chair duality is female, 0 otherwise	Bennouri, Chtioui, Nagati, & Nekhili, (2018), Kyaw, Treepongkaruna, & Jiraporn (2022) Nadeem, Zaman, & Saleem (2017)
Firm size	Size	Logarithm of total assets	Galbreath (2017)
Board size	Board_Size	The total number of board directors	Zona, Zattoni, & Minichilli (2013)

Profitability	Profitability	The ratio of earnings before interest and taxes (EBIT) to total assets	Gupta et al. (2018)
Leverage	Leverage	The ratio of long-term debt to total assets	Gupta et al. (2018)
Total compensation	TDC1	Logarithm of TDC1 from Execucomp to measure the total executive compensation	Harris, Karl, & Lawrence (2019)
Institutional blockholder ownership	Ibh_5pct	Ownership of institutional blockholders (>5%) in the percentage of market capitalisation at the year-end	Harris, Karl, & Lawrence (2019)
Corporate environmental performance score	En_score	The value of environmental scores from the Asset 4 ESG Score database	Kassinis et al., 2016
Environmental committee	En_Committee	A binary variable that takes the value of 1 if there is an environmental committee in the company, 0 otherwise	Liao, Luo, & Tang (2015)
Sponsor type	Sponsor	A binary variable that takes the value of 1 if there is at least one institutional sponsor to submit a proposal	Flammer et al. (2021)

Appendix G: The process of merging database for Chapter 3

Database	Information	Period	firms
ISS Shareholder Proposal S&P 1500	Shareholder proposals (initial dataset)	2010-2018	904
ISS Directors	Board characteristics	2010-2018	813
BoardEx	Board characteristics	2010-2018	794
CompustatFund	Financial	2010-2018	702
Factset	Accounting	2010-2018	674
Asset 4 ESG Score	Environmental performance	2010-2018	494

Appendix H: VIF analysis for Chapter 3

Variable	VIF	1/VIF
F_CEO	2.14	0.466445
F_Duality	2.06	0.485378
Size	1.81	0.551451
TDC1	1.55	0.645932
Board_Size	1.26	0.795500
WOCB	1.12	0.892981
Leverage	1.12	0.895440
Profitability	1.09	0.914728
Sponsor	1.07	0.938849
sWESP	1.06	0.944076
IOHHI	1.03	0.967774
Mean VIF	1.39	

Appendix I: Variables used in Chapter 3

Variable	Abbreviation	Definition	Source
Corporate environmental performance score	En_score	The value of environmental scores from the Asset 4 ESG Score database	Kassinis et al., 2016
The total number of environmental shareholder proposals withdrawn	sWESP	The total number of withdrawn environmental shareholder proposals filed in the given year	Bauer, Moers, & Viehs (2015)
Women on corporate boards	WOCB	The percentage of women directors to board size	Al-Shaer et al., (2022), Ben-Amar, Chang, & McIlkenny (2017), Terjesen & Singh (2008)
The number of women directors on corporate boards	numWOCB	The total number of women directors on corporate boards	Elmagrhi, Ntim, Elamer, & Zhang (2019)
Female CEO	F_CEO	A binary variable that takes the value of 1 if the inside CEO is female, 0 otherwise	Liu (2018), Palvia, Vähämaa, & Vähämaa (2015)
Female CEO-Chair duality	F_Duality	A binary variable that takes the value of 1 if the inside CEO-Chair duality is female, 0 otherwise	Beji, Yousfi, Loukil, & Omri (2021), Jo & Harjoto (2011), Pucheta-Martínez, Bel-Oms, & Olcina-Sempere (2018)

Firm size	Size	Logarithm of the market value of equity	Si & Xia (2022)
Board size	Board_Size	The total number of board directors	De Villiers et al. (2011)
Profitability	Profitability	The ratio of earnings before interest and taxes (EBIT) to total assets	Gupta et al. (2018)
Leverage	Leverage	Ratio of debt in current liabilities and long-term debt to total assets	Flammer (2015) and Francis et al. (2021)
Total compensation	TDC1	Logarithm of TDC1 from Execucomp to measure the total executive compensation	Harris, Karl, & Lawrence (2019)
Institutional Ownership Herfindahl-Hirschman index	IOHHI	The percentage of a company's shares held by institutional investors	DesJardine, Shi, & Sun (2022)
Sponsor type	Sponsor	A binary variable that takes the value of 1 if there is at least one institutional sponsor to submit a proposal	Flammer et al. (2021)

Appendix J: NAICS industry code information for Chapter 3

NAICS code	Industry	Environmentally sensitive
21	Mining	Yes
22	Utilities	Yes
23	Construction	Yes
31-33	Manufacturing	Yes
42	Wholesale trade	
44-45	Retail Trade	
48-49	Transportation and warehousing	Yes
51	Information	
52	Finance and Insurance	
53	Real estate rental and leasing	
54	Professional, scientific and technical services	
56	Administrative and support and waste services	
62	Health care and social assistance	
72	Accommodation and food services	
81	Other services (except public administration)	
99	Public administration	

Appendix K: All outcome and conditions used in Chapter 4

Variable	Abbreviation	Definition	Source
Corporate environmental performance score	Escore	The value of environmental scores from the Asset 4 ESG Score database	Moussa et al. (2020)
The total number of environmental shareholder proposals filed	ESP	The total number of filed environmental shareholder proposals filed in the given year	Lee & Lounsbury (2011), Reid & Toffel (2009), and Gupta et al. (2018)
Board gender diversity	WOCB	The percentage of women directors to board size	Al-Shaer et al., (2022), Ben-Amar et al. (2017), Terjesen & Singh. (2008)
Board independence	IND	The number of independent board members by the total number of board member	Al-Shaer et al. (2022), Goranova (et al., 2017)
Board size	Bsize	The total number of board directors	Campbell & Mínguez-Vera (2008)
Institutional Ownership Herfindahl-Hirschman index	IOHHI	The percentage of a company's shares held by institutional investors	DesJardine, Shi, & Sun (2022)
Institutional blockholder ownership	Ibh5	Ownership of institutional blockholders (>5%) in the percentage of market	Gine et al. (2017)

		capitalisation at the year-end	

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